

GIRI INSTITUTE OF DEVELOPMENT STUDIES. LUCKNOW

Seminar on

DEVELOPMENT AND INTER-REGIONAL DISPARITIES IN INDIA

19 March 1983

19 - 21 March, 1983.

INTRODUCTORY SESSION

10.30 - 11.00 AM

Welcome Address

T.S. Papola

Introductory Remarks

G.P. Mishra

Opening Remarks

P.N. Haksar

SESSION I : Inter-Regional Variations in Growth and Structure

11.15 AM - 01.30 PM

Chairman

- S.G. Tendulkar

✓ Moonis Raza and
Y.P. Agarwal

Historical Roots of Regional
Development in India

✓ Hemlata Rao

✓ Inter-State Disparities in
Development in India

2 - ✓ K.H. Dholakia

✓ Inter-State Variations in
Economic Growth and State Income
Inequalities in India

3 - ✓ K.R.G. Nair

✓ Inter-State Income Differential
in India (1970-71 to 1979-80)

4 - ✓ K.K. Singh

✓ Inter-State Differences in
Levels and Rates of Growth of
Income in India 1951-81

5 - ✓ N. Prasad

✓ Regional Variations in the
Structure of Development : A
Study based on Regional Input-
Output Tables

6 - ✓ K.T. Tewari

✓ Inter-State Disparities in
Levels of Development

7 - ✓ Amitabh Kundu

✓ Pattern of Industrialisation
in India - an analysis of
changing rural urban
ratio during 1951-81

SESSION II : Industrialization, Urbanization and Labour Force02.30 PM - 6.00 PM

CHAIRMAN

G.S. Bhalla

- ✓ S.P. Kashyap ✓ Pattern of Industrial Development Across States
- ✓ P. Venkatramaiah ✓ An Analysis of Industrial Linkages in the States of Indian Union
- ✓ K. Asthana ✓ Institutional Finance and Industry : Inter-regional Disparities
- ✓ D. Awasthi ✓ Patterns of Inter-regional Industrialization in India
- ✓ R.K. Bajpai ✓ Inter-regional Industrial Disparities in India
- ✓ Rakesh Mohan ✓ Regional Patterns of Urbanization in India
- ✓ Sarthi Acharya ✓ The Informal Sector in Developing Countries
- ✓ Deepak Grover, and Krishnappa ✓ Female Participation in Work : Demographic, Development and Social Dimensions
- ✓ K.S. Mathur ✓ Labour Force Utilisation

20 March 1983SESSION III : Agricultural Development and Rural Poverty09.30 AM - 01.30 PMAgricultural Development

CHAIRMAN

Y.K. Alagh

- ✓ P.H. Prasad ✓ A. Regional Aspect of Agricultural Dynamics in India
 ✓ Subsistence Agriculture and Indian Agriculture
- ✓ G.S. Bhalla ✓ Technological Change and Inter-State Variations in Agricultural Productivity
- ✓ J.P. Singh ✓ Rural Savings and Investment : Regional Dimensions
- ✓ Kishok Mody

21 ✓ V.N. Misra

✓ Some Aspects of Inter-State Disparities in Gross Value of Crop Output per hectre : 1960-61 to
Rural Poverty 1980-81

22 ✓ D.S. Tyagi

✓ Trends in Rural Poverty and Dis-trust of Growth : Some Methodo-logical Issues

23 ✓ Sudipto Mundle

✓ Inter-State Comparisons of the Effect of Agricultural Prices and Production on Rural Poor

24 ✓ Sheilla Shalla

✓ Growth, Employment and Wages in Agriculture
 ✓ Poverty, Unemployment and Levels of Living in India

25 ✓ K.K. Jain

21 March 1983SESSION IV : Social Services and Infrastructure09.30 AM - 01.30 PM

CHAIRMAN

Sheilla Shalla

26 ✓ V.G. Rao

✓ Regional Variations in Public Services : Structure, Growth and Determinants

~~X~~ Brahma Prakash

Education

27 ✓ P.R. Panchmukhi

✓ Education

28 ✓ B.K. Chaturvedi

✓ Power

~~X~~ Jaggar

Transport

SESSION V : Planning, Resources and Centre State Relations02.30 PM - 06.00 PM

CHAIRMAN

P.R. Panchmukhi

29 ✓ Thimmaiah

✓ Inter-State Disparities in Financial Allocations

30 ✓ K.K. George

✓ Inter-State Disparities in Plan Outlays

31 ✓ P.K. Bhargava

✓ Transfer from Centre to the States

32 ✓ M.M Ansari

✓ Financing of the State Plans :
A Perspective on Regional Development

33 ✓ D.N. Dwivedi

✓ Trends in Tax Efforts in Indian States

34 ✓ R.N. Lall

✓ Availability of Financial Resources and Inter-State Disparities in Economic Growth

N.B. : Tea Break at 11.00 AM and 03.30 PM and Lunch Break at 01.30 PM each day.

-Dk-

A

INTER STATE DISPARITIES IN DEVELOPMENT IN
INDIA

Dr. (Mrs) Hemlata Rao*

I

Introduction:

When development over different regions occurs un-equally, it becomes politically imperative to resort to corrective policy measures. This is crucial from all angles-political, economic and social considerations. An unchecked and uncontrolled process of growth leading to regional disparities, results in numerous economic, social and cultural problems. These problems take a serious shape and subsequently become hard to eliminate. The inequalities lead to incomplete utilisation of resources and to a growth of public costs involved in functioning of its economy. Politically, regional imbalances have far reaching effects. The very foundation of a federation can be weakened by increasing regional disparities. Prof. Abarkar rightly emphasised the need for bringing down regional disparities when he writes ".... Hence, there is a case for supporting the backward parts of the country at the expense of advanced even though the former did not promise rapid development into industrial or wealthy localities. For if these are not thus protected they might rapidly become nurseries for the bacilli of countless social evils, disease, crime and lawlessness - whose pestilential

*Associate Professor, Institute for Social & Economic Change, Bangalore 560 072.

effects on advanced areas may cost the latter much more"¹

In India, right from the inception of the planning era, the problems of balanced regional development had attracted the attention of economists, planners and politicians. Various Finance Commissions and the Planning Commission laid much emphasis on the objective of achieving balanced regional development. Thus, the very First Finance Commission, while drawing up the scheme of assistance, proclaimed, "the scheme of distribution should attempt to lessen the inequalities between states."² This consideration was generally kept in mind by all the succeeding Finance Commissions. Likewise, the planning commission has also been emphasising the need to redress regional disparities. The plan drafts of the third and the subsequent Five Year Plans stressed on this objective of equalisation. During the Fourth Five Year Plan Period, the concept of 'backward region' came to the surface and various committees were appointed to identify backward states and to suggest financial schemes for their development.

With this background, in this paper an attempt is directed at assessing the extent of inter-state disparities in various sectoral levels of development, infrastructural facilities and to trace the trends in regional disparities in development as measured by percapita state domestic product.

¹ Adarkar, B. P., Principles and Problems of Federal Finance, R.S. King & Son Ltd., London, 1933, Chap. XII, p.215.

² Govt. of India, "Report of the Finance Commission" 1952 Chap.I para 22.

II

Inter-State Disparities in India

In view of the continuing need to help states that are economically backward, it becomes essential to evolve some indicators for the measurement of relative economic backwardness. Any plan or policy towards regional development would call for an identification of backward regions. In a federal country, identification of backward states becomes necessary not only for the purpose of transferring resources from the centre to the federating states but also to assess the competing claims for additional assistance and or investments by different states. Quite often, one finds, state persuasion and pressure for additional central assistance on the plea of lessening regional disparities. To support their claims, individual state, it is frequent to find, may try to project its own standard for identifying less developed regions. Sometimes these divergent standards may assume serious proportions, thereby shaking the very foundation of the federation. Naturally, it becomes imperative on the part of the central government to develop a dispassionate and objective standard free from any kind of pressures, to identify differentially developed states. In this section an attempt is made to develop such a measure, using the statistical technique of Factor Analysis. The following steps are involved before arriving at a composite index of development. First: selection of suitable physical indicators of sectoral development.

Second: Derivation of sectoral indices by the method of Factor Analysis and

Third: Derivation of composite index of development by using various sectoral indices as the indicators of development and combining them together after assigning weights in terms of factor loadings.

The composite index of sectoral and aggregate indices help us in determining the extent and typology of backwardness in India.

The Model:

To state the method which we have employed more specifically, let x_{ij} (Y) be the 'j' th variable pertaining to 'Y' sector for 'i' th state. In the present study $X_i = 1, 2 \dots 51$ indicators $Y=1, 2 \dots 8$ sectors and $i = 1, 2 \dots 16$ states the 51 indicators are distributed into the following eight sectors:

| <u>No. of indicators</u> | | |
|--------------------------|----|-----------|
| 1. Agriculture | .. | 14 |
| 2. Industry General | .. | 6 |
| 3. Industry Small Scale | .. | 6 |
| 4. Banking | .. | 4 |
| 5. Transport | .. | 4 |
| 6. Power | .. | 4 |
| 7. Health | .. | 7 |
| 8. Education | .. | 6 |
| Total | .. | <u>51</u> |

The composite index either at the sectoral level or at the aggregate level is nothing but the factor score of individual

state obtained on the First Principal component. Thus the measure adopted is.

$$Z_{il} = \sum_{j=1}^n a_{ji} \times \frac{X_{ij}}{S_{ij}} \text{ Where}$$

Z_{il} = Factor Score(composite index) of 'i' the State on First Principal Component

a_{ji} = Factor loadings of the First Principal Component Vector relating to 'j' the indicator.

S_{ij} = Standard deviation of the X_j variable.

In a socio-economic analysis, when the purpose is to make the inter-regional comparison of relative levels of development or any other aspect, the first Factor Method at two stages is preferable. At the first stage, the initial variable relating to particular sectors are taken into account and first Factor for each of the sectors is derived. At the second, all the First Factors of different sectors are pooled together and their First Factor is derived to measure composite level of development.

Empirical Study:

To develop our model identifying differentially developed states and analysing inter-state disparities in development in India, we chose as already mentioned 51 indicators from eight specific sectors, the variables are listed below:

I. Agricultural Sector

1. Net sown area as % of total area %
2. Cropping intensity, %
3. Agricultural output per person employed in agriculture in Rs.
4. Fertiliser consumption per hect. in kgs.
5. Oil engines per 10,000 hect. of net irrigated area.
6. Electric pumpset for -do-
7. Tractors per lakh hectares of NSA
8. Extent of irrigations
9. Irrigation Intensity
10. Power consumption for agriculture as % of total consumption.
11. Agricultural society per 100 km.
12. Agri.society per lakh of population.
13. Milk productivity per Milch animal Lit. per day
14. Per capita availability of milk per day (gms.)

II. Industrial Sector : General

1. No.of Regd. Factories per 100 Km²
2. No.of Factories per 1 cr re population
3. Total Capital -do-
4. Factory employees per 1000 population
5. Value added by mfd. per 100 employees
6. Value -do- per lakh of population

III. Industrial Sector (Small Scale)

1. No. of small scale units per lakh of population
2. No. -do- per 100 Km²
3. Employees as % of population
4. Gross value of output per unit
5. Output per lakh of population
6. Output per 100 Km²

IV. Banking Sector

1. No.of Bank offices per 100 Km²
2. Population per bank office (inverse)
3. Deposit per capita
4. Credit per capita

V. Power Sector

1. Per capita consumption (units)
2. % of villages electrified.
3. Pumpsets energised.
4. Power generation per 10,000 population KWH.

VI. Transport Sector:

1. Total Road Length per 100 Km²
2. Percentage of surfaced Road length i.e. total road length.
3. Registered Motor vehicles per lakh of population
4. Goods vehicles per lakh of population.

VII. Health Sector:

1. No. of Hospitals per 100 km²
2. No. of Hospitals per lakh population.
3. No. of Dispensaries per 100 km²
4. Dispensaries per lakh of population.
5. Hospital beds per 100 km² lakh of population
6. Doctors per 100 km²
7. Doctors per lakh of population.

VIII. Education Sector:

1. Enrolment of student in I-V class as % of population in the age group 6-11 years.
2. Enrolment in VI-VII classes as % of population in the age group 11-14 years.
3. Enrolment in IX and above as % of population in the age group of 14-17 years.
4. Enrolment in colleges as % of population in the age group of 17 and above.
5. % of literates.
6. % of Female literates to total population.

The data are obtained from the statistical Abstract of India, 1979 and from Inter-state Economic indicators published by the Planning Department of Karnataka State. Data relate to the years 75-76 and 76-77. As an empirical exercise the study is subjected to the limitation of availability of data, which call for discriminate use of the available data and constant awareness of what is not available and caution in the interpretation of results.

Before, identifying states according to their overall levels of development, we shall briefly present their sectoral development profile:

i) Agricultural Sectors:

Agriculture is the most important sector in the country. Its importance needs hardly to be stressed, as majority of population depends upon this sector. In order to assess the

Table 1: Agricultural Indicators: 1975-76 & 1976-77

| Sl. No. | States | | | | N.S.A. T.Area % | G.S.A. N.S.A. % | Agricultural Output per Person engaged in Agri. in Rs. | Fertiliser Consum- ption per Hect. Kg. | Oil-engine per 10,000 hect.of N.I.H. | Electric pumpsets per 10000 hect.of N.I.H. | Tractors per 100000 N.S.A. hect. | N.I.H. as Y N.S.A. | G.I.H. as Y of N.I.H. | Power Consumption for agri.purpose % to total consump- tion | Agri.Co-op. Socie- ties per sq km (100) | Agri.Society per lakh of pop. | Milk Productivity per Milch animal Lit.per day | Per capita avai- lability of Milk (ml)per day |
|----------------------------|--------|--------|-------|-------|-----------------------|-----------------------|---|--|--|--|--|-----------------------|--------------------------|--|---|----------------------------------|--|---|
| | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | |
| 1. Andhra Pradesh | 38.63 | 111.89 | 1546 | 45.1 | 3.23 | 4.22 | 59.42 | 32.39 | 121.02 | 21.58 | 2.93 | 15.18 | 1.60 | 99 | | | | |
| 2. Assam | 34.12 | 123.69 | 979 | 2.1 | - | - | 18.66 | 21.35 | 100.00 | .53 | 4.12 | 16.27 | 1.15 | 66 | | | | |
| 3. Bihar | 46.18 | 135.63 | 1042 | 16.3 | 1.45 | 1.84 | 67.06 | 34.48 | 125.16 | 7.10 | 3.47 | 3.64 | 2.01 | 83 | | | | |
| 4. Gujarat | 51.11 | 105.93 | 1393 | 37.0 | 29.68 | 3.89 | 82.13 | 12.81 | 111.35 | 16.74 | 3.96 | 22.87 | 2.91 | 187 | | | | |
| 5. Haryana | 62.79 | 144.87 | 5532 | 40.7 | 2.73 | 32.92 | 504.60 | 49.31 | 150.05 | 35.39 | 5.44 | 13.65 | 3.46 | 445 | | | | |
| 6. Jammu & Kashmir | 15.71 | 131.65 | 1253 | 24.1 | - | - | 70.32 | 43.03 | 124.13 | 8.38 | 6.64 | 23.85 | 1.41 | 153 | | | | |
| 7. Karnataka | 46.29 | 167.14 | 2150 | 37.2 | 3.29 | 3.08 | 61.92 | 13.19 | 120.74 | 8.58 | 2.79 | 14.45 | 1.47 | 117 | | | | |
| 8. Kerala | 56.63 | 133.30 | 3207 | 36.1 | 8.14 | 4.52 | 68.15 | 10.04 | 168.73 | 3.42 | 4.15 | 6.36 | 2.69 | 94 | | | | |
| 9. M.R. | 41.83 | 112.52 | 1514 | 7.6 | 2.67 | 8.03 | 26.98 | 10.69 | 103.43 | 6.21 | 1.25 | 10.73 | 1.19 | 101 | | | | |
| 10. Maharashtra | 59.48 | 107.89 | 1615 | 21.3 | 9.38 | 9.27 | 30.61 | 10.02 | 121.11 | 8.97 | 6.50 | 29.44 | 1.23 | 69 | | | | |
| 11. Orissa | 37.62 | 122.66 | 2219 | 9.3 | 5.57 | - | 30.62 | 17.34 | 131.34 | 1.96 | 1.59 | 11.19 | .45 | 26 | | | | |
| 12. Punjab | 82.79 | 150.33 | 52.92 | 103.5 | 7.76 | 2.47 | 1017.52 | 76.65 | 159.04 | 31.79 | 19.46 | 53.68 | 4.14 | 524 | | | | |
| 13. Rajasthan | 44.04 | 112.21 | 23.30 | 3.6 | 1.30 | 1.38 | 77.69 | 17.31 | 114.11 | 19.75 | 1.51 | 15.19 | 2.32 | 265 | | | | |
| 14. Tamil Nadu | 46.21 | 118.98 | 1543 | 75.2 | 8.83 | 29.22 | 39.39 | 38.79 | 120.80 | 25.23 | 3.63 | 9.97 | 2.08 | 106 | | | | |
| 15. U.R. | 53.33 | 133.25 | 1673 | 43.6 | 2.45 | 1.23 | 156.55 | 46.54 | 117.93 | 30.36 | 2.92 | 7.77 | 2.13 | 153 | | | | |
| 16. West Bengal | 69.54 | 124.20 | 2649 | 31.5 | 4.33 | 11.32 | 24.07 | 103.49 | 1.13 | 7.51 | 12.10 | 1.98 | 45 | | | | | |
| 17. All India | 46.05 | 119.14 | 2016 | 31.4 | 4.44 | 4.65 | 105.63 | 24.82 | 123.90 | 14.59 | 3.10 | 14.93 | 2.06 | 122 | | | | |
| Coefficient of Variation % | 33.11 | 10.77 | 55.74 | 77.37 | 135.04 | 146.59 | 169.03 | 63.19 | 15.12 | 30.34 | 94.52 | 69.62 | 43.46 | 55.91 | | | | |

inter-state disparities in this sector, we selected 14 indicators, reflecting the extent and intensity of agriculture, irrigation availability, modernisation, credit facilities and so on. The data are presented in Table 1. The last row of the table measures the extent of disparities with respect to each of the variable in terms of coefficients of variation.

Factor Analysis of the 14 indicators brought out three important factors. The first factor explained about 72% of variance, the second factor explained about 13% of the total variance. As can be seen from table 2 Factor loadings of all the indicators except the 5th and 6th variables viz. oil engines and electric pumpsets, revealed high correlation between the indicators and the first factor. Thus, first factor in general measures overall agricultural development in India. The second factor has high correlation only with oil engines and the third factor has high correlation only with electric pumpsets. However, the factors 2 and 3 explain very little variance and hence only first principal component can be taken as an index of agricultural development.

The low coefficients on the 5th and the 6th variables indicate concentrated application of these variables in a few states like Haryana, Maharashtra and Gujarat.

Factor scores obtained by individual states are given, in column 1 of table 3. A careful perusal of these scores reveal that the states of Punjab, Haryana, Tamil Nadu, U.P., Kerala

Table 2 : FACTOR MATRIX

| Variable | Factor-I | Factor-II | Factor-III |
|----------|----------|-----------|------------|
| 1 | .793 | .136 | .077 |
| 2 | .693 | -.564 | .200 |
| 3 | .850 | -.089 | .196 |
| 4 | .815 | .181 | -.094 |
| 5 | .163 | .346 | -.367 |
| 6 | .360 | .446 | .690 |
| 7 | .965 | -.130 | -.143 |
| 8 | .793 | -.334 | .037 |
| 9 | .683 | -.075 | .261 |
| 10 | .745 | .280 | .266 |
| 11 | .817 | -.115 | -.433 |
| 12 | .703 | -.029 | -.598 |
| 13 | .868 | .273 | .029 |
| 14 | .905 | .036 | .011 |

Gujarat are the agriculturally developed states. On the contrary the states of M.P., Assam, Orissa, Karnataka, J & K and West Bengal, are the agriculturally backward states, Rajasthan, A.P., Bihar, Maharashtra, are the average states - moderately above or below national average level of agricultural development.

An examination of the coefficients of variation given in the last row of table 1 indicates the extent of regional disparities prevailing in India, with respect to each of the 14 indicators. A cursory look at the C.V. values reveal that there is wide disparities mainly with respect to the use of

一

Table 3: Sectoral indices and composite index of development

lift devices like oil engines & electric pumpsets and the use of tractors. The coefficients are as high as 133.04, 146.39 and 163.03 for oil engines, electric pumpsets and tractors respectively. This brings forth the lopsided and concentrated spread of modernisation and mechanisation of the agricultural sector in the country. The states, with high value on these variables are Gujarat in case of oil engines, Haryana and Tamilnadu in case of electric pumpsets and Punjab and Haryana in case of tractors. The next set of variables having more than 70% of C.V. value are: Agricultural coop. societies, per capita availability of milk, power consumption for agricultural purposes and fertiliser consumption.

There is very little inter-state disparities in case of cropping intensity and irrigation intensity. In these two cases, C.V. values are as low as 10.77% and 15.12%.

Another important variable responsible for inter-state disparities in agricultural development is the extent of irrigation, for which C.V. value was as high as 63.19%. With respect to this variable, the performance of states of Punjab, Haryana, U.P., J & K, Tamilnadu and Bihar is above average. The wide disparities in the extent of irrigation, can largely be attributed to the irrigation potential available to a state and the extent of created potential. It can be seen from Table 4, that the state of Punjab has already utilised 79.7% of its available irrigation potential. Thus the created potential as percentage of Net sown area is as high as 125.3%. This implies, that the Punjab has already created vast irrigation potential.

Table 4: Irrigation Potential & Utilisation

| Sl. No. | States | Net Irriga- tion Areas N.S.A. | Created Irrigation % to Potential % to N.S.A. | Created Potential % to available potential |
|------------|-------------|--|---|---|
| 1. | A.P. | 32.39 | 46.4 | 53.4 |
| 2. | Assam | 21.35 | 14.6 | 14.6 |
| 3. | Bihar | 34.40 | 57.3 | 38.6 |
| 4. | Gujarat | 12.81 | 25.0 | 52.2 |
| 5. | Haryana | 49.31 | 33.0 | 66.5 |
| 6. | J & K | 43.03 | 50.7 | 52.1 |
| 7. | Karnataka | 13.19 | 23.0 | 46.0 |
| 8. | Kerala | 10.04 | 35.0 | 37.6 |
| 9. | M.P. | 10.69 | 15.9 | 28.9 |
| 10. | Maharashtra | 10.02 | 16.0 | 39.9 |
| 11. | Orissa | 17.34 | 35.6 | 35.5 |
| 12. | Punjab | 76.65 | 125.3 | 79.7 |
| 13. | Rajasthan | 17.31 | 22.3 | 62.7 |
| 14. | Tamil Nadu | 30.79 | 51.2 | 72.0 |
| 15. | U.T. | 47.54 | 35.5 | 57.0 |
| 16. | West Bengal | 24.07 | 40.6 | 49.1 |

and hence could irrigate about 77% of its N.S.A. Infact the created potential is not fully utilised in the state. In case it is fully utilised, the state of Punjab will have irrigation surplus even at the present level of created potential. Further, if the available potential is fully exploited, it may be in a position to contribute substantially to its neighbouring states - Likewise, the performance of Haryana is also praise worthy. The created potential forms 30% of its N.S.A. and still, it has about 33.5% of potential which can further be tapped and create irrigation surplus in the state. Bihar, also has vast irrigation potential, however, its utilisation has been very much limited. The state has utilised only about 39% of its available potential, and out of this created potential actual utilisation has benefitted only 57.3% of N.S.A.. Bihar, with an appropriate irrigation policies can be made comparable with Punjab or Haryana with respect to Irrigation. On the other hand the state of Rajasthan has already utilised 65.2% of its available potential even with this high level of irrigation potential created, the state is in a position to irrigate only 22.3% of its N.S.A.. Thus the limited availability of irrigation potential and the extent of its utilisation, explains the causes of inter-state disparities in irrigation extent.

In sum, inter-state disparities in agricultural sector can mainly be attributed to the differential levels of states attained in case of mechanisation, modernisation, irrigation and credit availability.

ii. Industrial Sector:

Industrial development is bi-dimensional in India. One dimension relates to predominantly large and medium scale industries and the other relates to small scale industries. Therefore, in this paper we have analysed general industrial development and small scale industrial development separately.

For purposes of general industrial development, we selected 6 variables. Factor analysis, brought out two factors explaining the inter-state variance. The equation for the first factor or the index is:

$$Iq = .707x_1 + .900x_2 + .665x_3 + .925x_4 + .450x_5 + .949x_6 - (1)$$

It can be observed here that except the 5th variables which happens to be value added by manufacture per employee, all other variables are highly and positively correlated with F1. The Factor 1, which explains more than 66% of total variance, thus represents general industrial development.

Factor score of individual states are given in the 2nd column of table 3. It can be observed from the table that the states of Maharashtra, Gujarat, Tamil Nadu and West Bengal, Haryana and Punjab emerged as the highly developed states. The most backward states are J&K, Rajasthan, U.P., Orissa and A.P. and the states of Karnataka, Kerala, M.P. and Bihar emerged with average performance.

From table 5 one can gauge the extent of inequality in industrial development in India. The C.V. for no. of registered factories per 100 sq.km. is as high as 30.15%. Even with

relation to population, the spread of industries, appears to be lopsided, the C.V. for this variable is also as high as 56.00. In terms of number of registered factories, per 100 km² the state of Kerala stands first. However, its position declines on other variables. This shows that Kerala has large number of factories, employing very little capital and labour and the productivity of such units is also very low. On the other hand in states like Maharashtra and Gujarat, number of factories having large capital and labour force are predominant. Thus, the industrial structure shows the qualitative difference in the level of industrialisation in the country.

Coming to the small scale industrial development, we observe that, as in the case of general industrial development, in this case also, there is uni-directional development. The first Factor explains about 50% of variance. The equation for small scale industrial development is

$$Is = .915x1 + .929x2 + .93x3 + .594x4 + .964x5 + .965x6. \quad - 2.$$

The highly significant factor loadings reveal the unidirectional development of small scale industries. Factor scores given in the col. 7 places the state of Punjab at the first place followed by Haryana. The state of Maharashtra, which occupies the first place with respect to general industrial development occupies fifth place in case of small scale industries. Kerala, is very well advanced in this regard. It is needless to repeat the names of the backward states as the last positions once again go to M.P., Orissa J&K and so on.

Table 5: Indicators of Industrial Sectors(General)

| Sl. No. | States | No. of Regd. Fact- ries per 100 Km ² | No. of Fact. per one pop. crre pop. | Total capital per crre pop. | Total emplo- ees per popu- lation | Value added by mfd. per 100 of employee in Rs. | Value added per lakh population (Rs.) |
|------------|----------------|---|--|---|--|--|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1. | Andhra Pradesh | .40 | 253.13 | 203.42 | 6.3 | 94.72 | 59.77 |
| 2. | Assam | .59 | 234.17 | 200.80 | 5.0 | 131.63 | 66.83 |
| 3. | Bihar | .41 | 107.53 | 377.36 | 4.4 | 135.13 | 59.84 |
| 4. | Gujarat | .91 | 527.06 | 519.32 | 13.4 | 131.03 | 176.17 |
| 5. | Haryana | .90 | 311.63 | 450.00 | 5.0 | 158.55 | 112.06 |
| 6. | J&K | .03 | 113.33 | 86.17 | 3.3 | 17.00 | 5.83 |
| 7. | Karnataka | .50 | 259.46 | 270.32 | 7.6 | 113.79 | 86.72 |
| 8. | Kerala | 1.03 | 201.10 | 279.49 | 4.3 | 140.99 | 61.61 |
| 9. | M.P. | .27 | 236.00 | 291.03 | 4.4 | 141.67 | 63.35 |
| 10. | Maharashtra | 1.03 | 507.13 | 507.15 | 15.0 | 161.79 | 256.23 |
| 11. | Orissa | .11 | 70.72 | 270.00 | 3.6 | 162.53 | 58.70 |
| 12. | Punjab | 1.01 | 307.13 | 523.53 | 7.6 | 102.36 | 77.84 |
| 13. | Rajasthan | .09 | 97.07 | 230.70 | 3.6 | 126.04 | 45.84 |
| 14. | Tamil Nadu | 2.13 | 575.57 | 367.64 | 11.5 | 112.36 | 129.33 |
| 15. | U.P. | .40 | 120.05 | 217.73 | 4.5 | 95.87 | 43.91 |
| 16. | W.Bengal | 1.05 | 291.44 | 376.24 | 14.4 | 104.39 | 151.13 |
| 17. | All India | .56 | 270.24 | 332.63 | 7.9 | 121.44 | 96.47 |
| | C.V. % | 30.15 | 56.00 | 40.56 | 54.96 | 13.42 | 65.59 |

Table 6 highlights the inter-state disparities in the indicators of small scale industrial development. Inter-state disparities is the highest in terms of output per 100 km². The C.V. is as high as 104.85%. This is followed by regional spread of industrial units. The C.V. is low only for output per unit. This low C.V. i.e. 38.51% indicates that the inter-state disparities in the performance of industrial units is not as high as the spread of industrial units.

To sum up, industrial development either general or on small scale across the states is significantly unbalanced in India.

iii) Banking Development:

The role of Banks in the process of development is very crucial. Growth of banking facilities indicates the extension of organised credit to developing sectors of the economy.

In India, the banking system is not wide-spread. Banking facilities are concentrated in metropolitan and urban areas. It has yet to reach the corners of our vast rural part. Infact, in some of the states like J&K, Rajasthan and Assam, much is needed to develop banking system. In order to assess the individual states' position with regard to banking and to examine the extent of disparities we selected '4' indicators and concentrated on three aspects namely availability of Bank officer, credits and deposits. In case of banking sector also, we observe uni-directional development. The equation derived

Table 6: Indicators of Industrial Sectors (Small-scale)

| Sl. No. | States | No. of small Scale unit per lakh of pop. | Units per 100 Km ² | Employ- ees as % total pop. | Gross value of output per unit Rs. in lakh | Output per lakh pop. | Output per 100 Km ² in Rs. |
|------------|----------------|--|-------------------------------------|--------------------------------------|--|-------------------------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1. | Andhra Pradesh | 19 | 3.00 | .13 | 1.06 | 19.75 | 3.10 |
| 2. | Assam | 11 | 2.00 | .13 | 1.41 | 15.43 | 2.27 |
| 3. | Bihar | 9 | 3.00 | .11 | 1.30 | 12.77 | 4.14 |
| 4. | Gujarat | 37 | 5.00 | .43 | 2.11 | 70.13 | 10.64 |
| 5. | Haryana | 46 | 10.00 | .49 | 2.21 | 101.80 | 23.02 |
| 6. | J&K | 22 | .45 | .21 | 1.10 | 2.39 | .49 |
| 7. | Karnataka | 19 | 3.00 | .22 | 1.43 | 27.24 | 4.16 |
| 8. | Kerala | 29 | 16.00 | .59 | 1.36 | 54.27 | 29.74 |
| 9. | M.P. | 18 | 2.00 | .14 | .91 | 16.79 | 1.58 |
| 10. | Maharashtra | 31 | 5.00 | .43 | 3.44 | 105.06 | 17.20 |
| 11. | Orissa | 3 | 1.00 | .03 | 1.24 | 10.13 | 1.43 |
| 12. | Punjab | 101 | 27.00 | .91 | 1.73 | 130.30 | 43.33 |
| 13. | Rajasthan | 28 | 2.00 | .18 | .79 | 21.86 | 1.65 |
| 14. | Tamil Nadu | 39 | 12.00 | .52 | 2.01 | 70.11 | 24.74 |
| 15. | U.P. | 15 | 4.00 | .13 | 1.73 | 25.22 | 7.56 |
| 16. | W.Bengal | 31 | 16.00 | .40 | 1.94 | 60.99 | 30.75 |
| 17. | All India | 25 | 6.97 | .30 | 1.86 | 47.40 | 13.17 |
| | C.V. % | | 74.20 | 102.45 | 65.04 | 33.01 | 96.06 104.88 |

for banking sector is:

$$Bi = .622x_1 + .737x_2 + .919x_3 + .892x_4 -- 3$$

The first factor explained above about 70% of total variance.

Factors scores are given in the col.4 of Table 3. It can be observed from the table that in general all those states which have recorded high industrial values have also obtained high index value of Banking sector. Thus the states of Maharashtra, Punjab, Kerala, West Bengal, Gujarat and Tamil Nadu occupied the first six placements. The states of Assam, Orissa, Bihar, M.P., Rajasthan and U.P. remained at the bottom.

The extent of Inter-state disparities is the highest with respect to spatial distribution of bank offices i.e. 87.53% followed by credit availability per capita for whom the C.V. was 67.43%. However, all the C.V.% are high enough to indicate the wide inter-state disparities in the development of Banking sector (see Table 7).

iv) Power Sector:

Modernisation and technical advancement very much depends upon the advancement of power sector. Cheaper, assured and adequate supply of power is crucial for the development of modern industrial development and rationalisation of agricultural sector. Variation in power development largely explains variation in various other sectoral development and overall development across the states. This sector is examined on the basis of 4 indicators relating to power generation, consumption,

Table 7: Banking Indicators

| Sl. No. | States | No. of commercial banks per 1000 Km ² | Populati- on per bank office (000) | Deposits per capita | Credit per capita |
|-------------------------------|----------------|---|--|---------------------------|----------------------|
| 1. | Andhra Pradesh | 9 | 76.44 | 297 | 210 |
| 2. | Assam | 6 | 57.20 | 157 | 65 |
| 3. | Bihar | 11 | 63.39 | 137 | 77 |
| 4. | Gujarat | 11 | 34.36 | 642 | 351 |
| 5. | Haryana | 17 | 82.77 | 413 | 284 |
| 6. | J&K | 2 | 34.02 | 492 | 163 |
| 7. | Karnataka | 14 | 55.95 | 435 | 336 |
| 8. | Kerala | 56 | 98.41 | 470 | 305 |
| 9. | M.P. | 4 | 31.70 | 197 | 98 |
| 10. | Maharashtra | 11 | 51.67 | 972 | 747 |
| 11. | Orissa | 5 | 67.76 | 127 | 72 |
| 12. | Punjab | 31 | 59.20 | 952 | 402 |
| 13. | Rajasthan | 4 | 76.02 | 201 | 136 |
| 14. | Tamil Nadu | 22 | 82.84 | 469 | 393 |
| 15. | U.P. | 13 | 70.36 | 260 | 117 |
| 16. | W.Bengal | 23 | 73.29 | 671 | 419 |
| 17. | All India | 10 | 78.91 | 460 | 314 |
| Coefficient of Variation % | | 67.53 | 40.24 | 59.35 | 67.43 |

rural electrification and energised pumpsets. Factor Analysis of these four indicators reveal that, all the four are moving in the same direction. This can be observed from the following equation:

$$Pi = .910x1 + .364x2 + .633x3 + .912x4 - 4$$

the first factor explains 80% of total variation and hence can be taken as an index of power-sectoral development. Factor scores given in the column 5 of table 3 indicates the relative placements of the states. It can be observed from the table that the performance of Punjab is the best followed by the states of Maharashtra, Haryana, Tamil Nadu, Gujarat and Kerala. The states of Assam, Bihar, U.P. J&K and also West Bengal are very much laggin behind. It is interesting to note that inspite of the fact that W.Bengal is an industrial state, it is backward in terms of power development. The main reason for the low index value of West Bengal can be sought in terms of rural electrification and pumpsets energised this can be examined from Table 3 the coefficients of variation for all the four variables are high enough to highlight the extent of inter-state disparities in power development. The C.V. for energised pumpsets is the highest of all the four indicators. This indicates the use of electricity for agricultural purposes limited to a few states. In a state like Madras pumpsets energised per 100 hect. of irrigated area works out to be 299 as against only 2 in J&K, 4 in Assam on 6 in Orissa. Similarly, while in Punjab, Haryana and Kerala 100% of villages are electrified, in M.P. only 31%. Even per capita consumption of power indicates wider disparities.

Table 8: Power Indicator

| Sl. No. | States | Per capita power consumption (units) | % of electrified villages | Pumpsets energised per 000 hect. of irrigated area | Power generation per 000 population. K.W.H. |
|-------------------------------|----------------|---|---------------------------------|---|---|
| 1. | Andhra Pradesh | 91 | 60.5 | 79 | 97.37 |
| 2. | Assam | 36 | 19.2 | 4 | 29.59 |
| 3. | Bihar | 83 | 29.0 | 32 | 36.93 |
| 4. | Gujarat | 230 | 59.5 | 82 | 209.32 |
| 5. | Haryana | 212 | 100.0 | 67 | 234.10 |
| 6. | J&K | 70 | 70.0 | 2 | 54.16 |
| 7. | Karnataka | 151 | 60.6 | 137 | 122.95 |
| 8. | Kerala | 101 | 100.0 | 99 | 176.02 |
| 9. | M.P. | 96 | 31.1 | 95 | 99.69 |
| 10. | Maharashtra | 223 | 71.2 | 205 | 230.97 |
| 11. | Orissa | 116 | 36.7 | 6 | 121.71 |
| 12. | Punjab | 305 | 100.0 | 50 | 264.43 |
| 13. | Rajasthan | 93 | 41.6 | 55 | 82.61 |
| 14. | Tamil Nadu | 105 | 90.8 | 289 | 116.33 |
| 15. | U.P. | 89 | 34.3 | 24 | 83.85 |
| 16. | West Bengal | 122 | 33.5 | 3 | 94.49 |
| 17. | All India | 131 | 43.4 | 70 | 133.61 |
| Coefficient of Variation % | | 51.41 | 46.75 | 93.67 | 61.62 |

In Punjab power consumption per capita is 303 units per day as against 36 units in Assam. Thus, in sum, there is wide disparity in the consumption, generation and rural electrification among the states.

v. Transport Development

A good transport network has the same crucial role to play as the nerve system has in the human body. Transport system includes, railways, roadways, air-ways and water-ways. However, due to data constraints, in this section, we are examining transport development only in relation to roadways. We selected four indicators for this purpose. The variables are: Total Road length per 100 km², % of surfaced road, motor vehicles per lakh of population and number of goods vehicles per lakh of population. The Factor analysis brought out two factors explaining about 80% variance. The first factor explained about 50% and the second explained about 30% of variance. The following factor matrix reveals the relative importance of the variables on the two factors.

Factor Matrix

| <u>Indicators</u> | <u>Factors-I</u> | <u>Factors-II</u> |
|-------------------|------------------|-------------------|
| 1 | .167 | .941 |
| 2 | .666 | -.417 |
| 3 | .920 | .123 |
| 4 | .760 | .339 |

It can be observed that Transport sector has bi-dimensional development, first dimension is general development, the second

Table 9: Transport Indicator

| Sl. No. | States | Total Road length per 100 km ² | Surface Road length % to total Road | Registered motor vehicle per lakh population | Goods vehicles per lakh of pop. |
|-------------------------------|----------------|---|---|--|--|
| 1. | Andhra Pradesh | 32.15 | 52.00 | 343 | 461 |
| 2. | Assam | 61.26 | 10.00 | 330 | 663 |
| 3. | Bihar | 44.27 | 25.00 | 203 | 303 |
| 4. | Gujarat | 20.35 | 59.00 | 700 | 567 |
| 5. | Haryana | 33.99 | 100.00 | 400 | 767 |
| 6. | J & K | 3.91 | 74.00 | 370 | 683 |
| 7. | Karnataka | 46.25 | 55.00 | 670 | 635 |
| 8. | Kerala | 23.22 | 20.00 | 469 | 609 |
| 9. | M.P. | 11.79 | 76.00 | 213 | 336 |
| 10. | Maharashtra | 28.85 | 49.00 | 884 | 1110 |
| 11. | Orissa | 23.23 | 30.66 | 134 | 342 |
| 12. | Punjab | 51.03 | 100.00 | 1411 | 794 |
| 13. | Rajasthan | 12.39 | 56.00 | 365 | 369 |
| 14. | Tamil Nadu | 74.65 | 54.70 | 409 | 527 |
| 15. | U.P. | 43.91 | 32.95 | 200 | 229 |
| 16. | W.Bengal | 14.19 | 19.32 | 375 | 602 |
| 17. | All India | 38.86 | 41.87 | 475 | 539 |
| Coefficient of variation % | | 57.60 | 51.89 | 63.20 | 38.26 |

is in terms of availability of total road length irrespective of the quality of roads. The states of Tamil Nadu, Assam, Bihar and U.P. have the maximum road length, however, the quality of road is not satisfactory. Thus while interpreting the index figures for these states, it should be noted that these do not have satisfactory quality of road length.

The Table 3 presents factor scores of states on Factor I of the transport sector. From this it can be observed that the state of Punjab emerges as the highly developed state followed by Maharashtra, Haryana, Karnataka and Gujarat. Infact the states of Tamil Nadu, Bihar, Assam and U.P. would have scored higher index values, if they had better quality roads as is evident from the factor Matrix. Generally backward states remained backward in case of this sector also. The extent of disparities is also very high as can be seen from the Table 9.

vi) Health Sector

'Health' of the society is an important aspect of social development. In India, the performance of this sector is very poor. Viewed from the angle of availability of health services or quality of such services, this sector emerges as very backward. While in general, 'health' is backward in all the states, inter-state variation in the extent of backwardness is also very marked.

In order to analyse the performance of this sector, we selected seven indicators whose values are given in table 14. When these variables were analysed by Factor Analysis method,

two dimensions of health sectoral development emerged. The first factor depicting the first dimension reflected development along the large sized hospitals and related benefits, while the second dimension brought out development in terms of dispensaries and number of doctors per lakh of population. These two aspects can be studied from the following Factor Matrix.

Factor Matrix

| <u>Variables</u> | <u>Factor-I</u> | <u>Factor-II</u> |
|------------------|-----------------|------------------|
| 1 | .544 | -.457 |
| 2 | .327 | -.394 |
| 3 | .595 | .243 |
| 4 | .348 | <u>.346</u> |
| 5 | .919 | -.122 |
| 6 | .722 | .116 |
| 7 | .323 | <u>.997</u> |

The first factor explained about 53% of total variation and the second explained about 30%. The first factor thus measures general development, while second factor measures development along the availability of dispensaries and doctors.

As can be seen from table 3, the performance of Kerala state is exceptionally good in terms of health on Factor-I. This is followed by Punjab, Maharashtra, A.P., Tamil Nadu, J&K and Karnataka. As usual Bihar, M.P., Orissa, Rajasthan lags behind in this sector also. If we take into consideration the second dimension of health sector along with availability of dispensaries and doctors, the position of Assam improves. However, the

Table 1: Health Indicators

| Sl. No. | States | No.of hospi- tal per 100 sq. km. | Hospi- tals per lakh of pop. | Dispens- aries per lakh of km ² | Dipp. per pop. | Hospi- tal beds per lakh of pop. | Docto- rs per 100 sq.km. | Doctor per lakh of pop. |
|-------------------------------|----------------|--|---------------------------------------|---|----------------------|--|-----------------------------------|----------------------------------|
| 1. | Andhra Pradesh | 2.17 | 112.73 | 2.71 | 140.63 | 6.74 | 6.69 | 3.47 |
| 2. | Assam | 1.37 | 54.27 | 5.36 | 211.55 | 5.02 | 3.15 | 3.22 |
| 3. | Bihar | 1.24 | 35.94 | 2.69 | 67.4 | 3.43 | 3.23 | 2.05 |
| 4. | Gujarat | 1.3 | 50.11 | 2.01 | 165.03 | 6.76 | 6.22 | 3.62 |
| 5. | Haryana | 1.02 | 64.34 | 5.31 | 184.40 | 6.20 | N.A. | N.A. |
| 6. | J & K | .15 | 50.33 | 2.91 | 180.00 | 3.33 | 5.53 | 21.50 |
| 7. | Karnataka | 1.12 | 53.10 | 6.64 | 344.50 | 3.65 | 3.40 | 4.35 |
| 8. | Kerala | 1.50 | 200.42 | 9.30 | 295.27 | 10.60 | 24.53 | 3.75 |
| 9. | M.P. | .55 | 46.03 | 1.45 | 123.03 | 3.45 | 2.23 | 1.89 |
| 10. | Maharashtra | 3.14 | 154.22 | .19 | 500.63 | 13.71 | 11.29 | 5.54 |
| 11. | Orissa | 1.7 | 111.14 | 1.96 | 116.35 | 4.56 | 4.40 | 2.65 |
| 12. | Punjab | 2.7 | 66.02 | 10.43 | 506.22 | 8.90 | 31.20 | 11.52 |
| 13. | Rajasthan | .63 | 63.03 | 2.90 | 201.73 | 5.06 | 2.11 | 4.33 |
| 14. | Tamil Nadu | 2.07 | 77.22 | 5.02 | 156.73 | 3.52 | 21.26 | 5.72 |
| 15. | U.P. | 2.44 | 64.02 | 4.65 | 123.44 | 4.60 | 7.10 | 1.68 |
| 16. | W.Bengal | 3.09 | 62.75 | 4.61 | 74.31 | 9.00 | 33.93 | 5.47 |
| 17. | All India | 1.76 | 45.04 | 4.51 | 216.34 | 7.64 | 7.16 | 3.47 |
| Coefficient of variation % | | 151.25 | 70.60 | 37.74 | 39.64 | 51.43 | 94.33 | 93.89 |

composite picture remains the same. The coefficients of variation are very high for all the indicators.

vii) Education Sector:

Education sectoral development is also an important social variable. Improvement in education level indicates improvement in the quality of human resources. Education development is indicated by six indicators listed in the text. The factor analysis brought out uni-directional development of this sector. The equation for educational sectoral development is:

$$Ei = .32x1 + .938x2 + .931x3 + .731x4 + .964x5 + .965x6 - (5)$$

It can be observed from the above that all the variables are highly correlated with Factor 1 and this factor explains about 95% of total variance.

Factor scores given in Table 3, places the state of Kerala at the highest place followed by Punjab, Tamil Nadu, Maharashtra, Gujarat, Karnataka and West Bengal. Once again the performance of Rajasthan, U.P., M.P., Bihar and other backward states are very discouraging.

It is interesting to observe from Table II that, inter-state disparities are not very high in respect of any of the indicators except female literacy rate, in India. It is interesting to observe that the inter-state disparities are low at the primary and college level, while at the higher primary and high school level, disparities are more. The reason for this observation can be sought in terms of the educational policy of

Table 11: Education Indicators

| Sl. No. | States | I to V Age | VI-VII Age | IX & above Age | College Age | Total literature | Female litera- ture |
|----------------------------|----------------|---------------|---------------|-------------------|----------------|---------------------|---------------------------|
| 1. | Andhra Pradesh | 72.6 | 25.9 | 10.5 | 4.5 | 29.01 | 6.34 |
| 2. | Assam | 72.2 | 31.7 | 16.3 | 4.5 | 21.53 | 6.04 |
| 3. | Bihar | 74.5 | 21.4 | 9.3 | 3.5 | 16.00 | 3.43 |
| 4. | Gujarat | 97.1 | 42.5 | 24.7 | 4.0 | 23.10 | 9.30 |
| 5. | Haryana | 58.2 | 42.0 | 11.0 | 5.1 | 20.92 | 5.37 |
| 6. | J & K | 63.7 | 39.4 | 20.0 | 3.3 | 14.30 | 3.33 |
| 7. | Karnataka | 59.1 | 35.0 | 17.2 | 6.0 | 24.96 | 8.11 |
| 8. | Kerala | 104.2 | 92.6 | 30.0 | 6.2 | 50.70 | 23.00 |
| 9. | M.P. | 65.9 | 27.6 | 12.0 | 2.7 | 17.70 | 4.23 |
| 10. | Maharashtra | 102.9 | 44.1 | 26.1 | 4.1 | 31.50 | 10.24 |
| 11. | Orissa | 51.4 | 25.2 | 14.1 | 2.6 | 21.04 | 5.77 |
| 12. | Punjab | 112.7 | 57.3 | 24.7 | 6.1 | 27.32 | 9.74 |
| 13. | Rajasthan | 54.7 | 26.3 | 14.5 | 3.0 | 14.41 | 3.04 |
| 14. | Tamil Nadu | 106.7 | 40.6 | 25.0 | 4.1 | 33.65 | 11.33 |
| 15. | U.P. | 65.9 | 34.2 | 16.1 | 3.0 | 17.26 | 3.93 |
| 16. | W.Bengal | 73.0 | 32.6 | 18.3 | 5.5 | 26.99 | 8.58 |
| 17. | All India | 59.5 | 36.9 | 18.3 | 4.2 | 23.60 | 7.22 |
| Coefficient of variation % | | 42.43 | 30.73 | 27.83 | 36.87 | 61.76 | |

the educational policy of the state governments. Almost in all the states, education at primary level is made free and compulsory and hence, there is not much of variation at the primary level. At the college level-population in the age group 17-23 has to choose between education and employment - and generally in all the states, due to economic pressure, employment is preferred to college education. Since economic pressure on working age group is more or less the same in all the states, there is less disparity across the states with respect to college education. Inter-state disparity is distinct in case of % of female literates in the total population. Female education very much depends upon the social outlook of various states. Thus while in states like Kerala, Tamil Nadu and Maharashtra liberal view is prevailing about female education, in states like Rajasthan, Bihar, J&K, Rajasthan and U.P. lot more is required to be done to change the attitude of people towards female education and this reflects the social backwardness of the various states.

vii. Composite Level of Development:

So far we have constructed and analysed sectoral indices. These indices by themselves are not sufficient to reflect the overall development of states. Some states may be highly developed with respect to agriculture, some may be developed industrially. In order to get an overall view of the position of various states and to get a composite picture of development, the eight sectoral indices are pooled together. Thus, taking the sectoral indices as raw data, final index is derived. The

correlation Matrix for these eight variables are given below:

Table 12: Inter-Correlation Matrix

| <u>Sl. No.</u> | <u>Banking</u> | <u>Agri.</u> | <u>Ind.(G)</u> | <u>Ind.(S.S)</u> | <u>Power</u> | <u>Trans.</u> | <u>Health</u> | <u>Edn.</u> |
|--------------------|----------------|--------------|----------------|------------------|--------------|---------------|---------------|-------------|
| 1. | 1.00 | | | | | | | |
| 2. | .52 | 1.00 | | | | | | |
| 3. | .69 | .23 | 1.00 | | | | | |
| 4. | .63 | .33 | .63 | 1.00 | | | | |
| 5. | .65 | .67 | .70 | .62 | 1.00 | | | |
| 6. | .79 | .75 | .54 | .79 | .83 | 1.00 | | |
| 7. | .72 | .36 | .25 | .64 | .47 | .41 | 1.00 | |
| 8. | .78 | .37 | .54 | .69 | .66 | .45 | .89 | 1.00 |

The above correlation matrix reveals that all the eight sectoral indices are positively and significantly correlated among themselves.

However, factor analysis produced two factors - thus reflecting bi-dimensional development in India. This can be seen from the following Factor Matrix.

| <u>Variables</u> | <u>Factor Matrix</u> | |
|--------------------|----------------------|-------------|
| | <u>F-I</u> | <u>F-II</u> |
| 1. Banking | .941 | .116 |
| 2. Agricultural | .711 | -.457 |
| 3. Industrial(G) | .695 | -.059 |
| 4. Industrial(S.S) | .944 | -.133 |
| 5. Power | .015 | -.209 |
| 6. Transport | .348 | -.357 |
| 7. Health | .715 | .618 |
| 8. Education | -.17 | .531 |

The first factor in general has high correlation with all the eight indices and explains about 73% of total variance. The second factor has high factor loadings on health and education indices thus while the First factor measures general development, the second factor measure social development.

An examination of the factor scores given in the last column of table 3 reveals that the state of Punjab is the most developed state in India as it obtained the highest Index value i.e. 29.0, followed by Maharashtra, Kerala, Tamil Nadu, Haryana, Gujarat, West Bengal and Karnataka. On the other hand, Bihar is the most backward state preceded by Orissa, Assam, M.P., Rajasthan, U.P., J&K and A.R.

An examination of the ranking pattern obtained on composite index and that on per capita state domestic product brings out some conspicuous difference with respect to one or two states.

Table 13

| States | Ranks on composite index | Ranks on SDP per capita 1975-76 |
|-------------------|--------------------------|---------------------------------|
| 1. Andhra Pradesh | 9 | 3 |
| 2. Assam | 14 | 12 |
| 3. Bihar | 16 | 16 |
| 4. Gujarat | 6 | 4 |
| 5. Haryana | 5 | 3 |
| 6. J&K | 10 | 9 |
| 7. Karnataka | 8 | 6 |
| 8. Kerala | 3 | 7 |
| 9. M.P. | 13 | 13 |
| 10. Maharashtra | 2 | 2 |
| 11. Orissa | 15 | 15 |
| 12. Punjab | 1 | 1 |
| 13. Rajasthan | 12 | 10 |
| 14. Tamil Nadu | 74 | 11 |
| 15. U.P. | 11 | 14 |
| 16. W.Bengal | 7 | 5 |

The above table brings forth that there is very marginal changes in the relative position of various states on the above two indices.

Thus, Kerala which occupies 3rd place on composite index obtains sixth place on percapita income and Tamil Nadu which obtains 4th place on composite index gets 11th place on SDP index. The reason for this may be sought in terms of development of these states in the social sector especially of Kerala and the relatively low performance in the productive sectors. Thus, the presence of second dimensions of development - relating to social development, which adds relatively less to the SDP, explains, the reason for the difference in the ranking position of these states.

An analysis of table 3 brings forth the extent of inter-state disparities with respect to each of the eight sectoral indices. The extent of variation can be low either because of wide-spread and evenly spread development of a sector or because of wide-spread backwardness of a sector. To ascertain, whether, the low coefficients of variation are due to even development or due to even backwardness, forms a separate question - which needs an analysis of separate sectors in relation to some national or international norms. However we are not going into this aspect. By looking into the co-efficients we can only say with respect to which sector, inter-state disparities are more pronounced. The table reveals that inter-state disparity is the highest in case of small scale industrial

sector (68.54%) followed by Health (58.77%), Power (52.87%) and General Industrial development (43.59%).

On the other hand, inequalities are relatively less in case of Banking, education, transport and agricultural sector, However, the coefficients for all the sectors are high enough to indicate the wide inter-state disparities. Thus the coefficient of variation for composite index (32.74%) brings out the extent of inter-state disparities.

Based on the analysis of sectoral and composite level of development, we can classify the states into various groups according to their typology of development. Thus, the following groups emerge out of the analysis:

1. All round development: This group consists of those states, which have shown sufficient development in all the sectors viz. productive consisting of agricultural and industrial sectors, infrastructure consisting of Banks, Power and transport and social sector including Health and Education. In this category one can put the states of Punjab and Tamil Nadu and Kerala.
2. Developed states having one of the productive sectors backward: In this category the state of Maharashtra is included. This state has a relatively backward agricultural sector.
3. Developed states with backward social sector. In this category, the states of Gujarat and Haryana are included. They had backward Health sector.
4. States with multi-sector backwardness: in this category comes the state of West Bengal which emerged as backward with respect to agriculture, power and transport and Karnataka, which was backward with respect to productive sectors.
5. Backward States: with one of the sectors developed: In this category we can put the states of U.P. & A.P. which have agricultural and health sector development respectively.
6. Highly Backward states: In this category we can put the remaining states of Orissa, M.R., Assam, Bihar and Rajasthan, having backwardness in all the sectors.

Trends in Regional Disparities in India

In the previous section, it is clearly brought out that inter-state disparities in the sectoral as well as aggregate levels of development is very high in India. However, more alarming than the extent of disparities is the trend in regional disparities. In order to trace the trend we are employing here the widely used measure of development i.e. per capita state domestic product. The reasons for using this measure are:

1. The high correlation between the composite index based on physical variables and the per capita SDP measure.
2. Non-availability of comparable composite index for previous years and
3. The availability of comparable per capita SDP figures across the states.

One may wonder, if the per capita SDP is comparable, available and can be taken as a measure of development, where was the necessity to go for the detailed construction of a composite index? Without going into the details of the merits and demerits, we can briefly point out that while there is positive correlation between the composite index and per capita SDP, the latter cannot fully substitute the former. Further the sectoral indices and composite index throw more light on the various aspects of development and bring out the typology of development, extent of disparities with respect to different aspects of development while per capita SDP only measures the overall average performance of a state. Thus, from the point of policy making a combination of per capita SDP and physical indices provide a comprehensive basis.

Table 14: Per capita SDP, 60-61 to 79-80 (at current prices)
(Rs.)

| Sl. No. | State | 1960- 1961 | Rank | 65-66 | Rank | 70-71 | Rank | 75-76 | Rank | 79-80 | Rank |
|------------|----------------------|---------------|------|-------|------|-------|------|-------|------|-------|------|
| 1. | Andhra Pradesh | 275 | 10 | 357 | 8 | 584 | 9 | 903 | 5 | 1002 | 8 |
| 2. | Assam | 315 | 7 | 399 | 7 | 538 | 11 | 776 | 12 | 961 | 11 |
| 3. | Bihar | 215 | 16 | 332 | 13 | 432 | 16 | 661 | 16 | 735 | 16 |
| 4. | Gujarat | 362 | 4 | 400 | 4 | 329 | 3 | 1215 | 4 | 1452 | 4 |
| 5. | Haryana | 327 | 6 | 453 | 5 | 645 | 2 | 1274 | 3 | 1472 | 3 |
| 6. | J&K | 269 | 11 | 317 | 15 | 524 | 12 | 653 | 9 | 906 | 10 |
| 7. | Karnataka | 266 | 9 | 356 | 9 | 655 | 6 | 1005 | 6 | 1129 | 6 |
| 8. | Kerala | 259 | 13 | 300 | 10 | 560 | 10 | 907 | 7 | 937 | 9 |
| 9. | M.P. | 260 | 12 | 305 | 16 | 439 | 13 | 769 | 13 | 905 | 14 |
| 10. | Maharashtra | 409 | 1 | 534 | 1.5 | 809 | 4 | 1393 | 2 | 1637 | 2 |
| 11. | Orissa | 217 | 15 | 329 | 14 | 432 | 15 | 715 | 15 | 799 | 15 |
| 12. | Punjab | 374 | 3 | 534 | 1.5 | 1030 | 1 | 1597 | 1 | 1962 | 1 |
| 13. | Rajasthan | 254 | 9 | 373 | 11.5 | 623 | 7 | 350 | 10 | 925 | 12 |
| 14. | Tamil Nadu | 334 | 5 | 403 | 6 | 595 | 5 | 840 | 11 | 1036 | 7 |
| 15. | U.P. | 252 | 14 | 373 | 11.5 | 406 | 14 | 730 | 14 | 916 | 13 |
| 16. | W.Bengal | 390 | 2 | 532 | 3 | 735 | 5 | 1116 | 5 | 1268 | 5 |
| 17. | Other states - | - | - | - | - | - | - | - | - | - | - |
| | All India | 307 | | 420 | | 633 | | 1033 | | 1214 | |
| | C.V % | 19.06 | | 10.64 | | 25.70 | | 26.67 | | 26.59 | |
| | Gini- coefficient | 1146 | | .1129 | | .1165 | | .1273 | | .1205 | |

A cursory look at table 14 reveals that there has been an increase in the percapita SDP during the past 20 years. Percapita SDP for the country as a whole increased from Rs.307 in 1960-61 to Rs.429 in 1965-66, to Rs.633 in 1970-71, to Rs. 1033 in 1975-76 and to Rs.1214 in 1979-80. This trend can be traced for all the states, without any exception. However, along with an increase in the absolute level of income, inter-state disparities have also widened. The last two rows of table 14 present the coefficients of variation and Gini coefficients, for the benchmark years. It can be observed that coefficients of variation continuously increased from 19.08% in 1960-61, to 23.59% in 1979-80. Except during the period, 1965-66, when the C.V. value marginally declined from 19.08% in 1960-61 to 13.64%, during all other years - it has increased. Between 1965-66 and 70-71 there had been a significant increase in in-equalities in India.

The same trend is further supported by the gini-coefficients of the benchmark years. As in the case of C.V. in case of Gini-coefficient also, the values declined marginally in 1965-66 but for all other years the coefficients recorded higher values. Thus, Gini values increased from .1146 to 1205 during the period 60-61 to 79-80.

These coefficients clearly reveal the increasing trend in inter-state disparities in development in India. Further, while the average SDP for all the states has gone up, the relative ranking positions have remained more or less the same.

It can be observed from Table 15 which gives coefficients of rank correlations:

Table 15: Coefficients of Rank Correlation

| | 1960-61 | 1965-66 | 1970-71 | 1975-76 | 1979-80 |
|-------|---------|---------|---------|---------|---------|
| 60-61 | | | | | |
| 65-66 | .89 | | | | |
| 70-71 | .88 | .85 | | | |
| 75-76 | .88 | .79 | .94 | | |
| 79-80 | .88 | .89 | .94 | .96 | - |

the high positive coefficients reveal that the relative positions of the states have undergone negligible changes. When observed individually it can be seen from table 14 that most of the backward states have remained at the bottom and mostly exchanged relative positions among themselves. Thus U.P. which occupied the 14th place in 1960-61 improved its place to 13 by going ahead of M.P. Rajasthan lost its 9th place to Kerala in 1979-80. Thus the interchange in the ranks of the backward states has been against or in favour of the backward states. Similarly there has been inter-change in the relative positions among the developed states. Thus, Punjab replaced Maharashtra, Haryana went ahead of Gujarat and so on. This clearly brings out the regressive direction of the changes in the relative positions of the states. The change would have been progressive if a backward state had taken the place of a

developed state (of course not due to deterioration in the development level of a developed state but due to increased rate of growth in the backward state).

In table 16: growth rate of per capita SDP is presented. It can be observed from the table that during 1960-61 and 70-71, the developed states of Punjab, Haryana, Gujarat, Tamil Nadu and so on showed very high rate of growth, while the backward states of Assam, M.P., U.P., Bihar and so on in general recorded very low rate of growth: Among the developed states only Maharashtra and West Bengal had very low rate of growth in the period between 1960-61 and 70-71. Between 70-71 and 79-80 overall growth rate has declined to 90.2% as against 158.86% in the previous decade. During the second decade the performance of Assam and Maharashtra had been good - as they have recorded increased rate of growth. Barring these two states, all other states have recorded a falling rate of growth.

A combined analysis of the rates of growth and the extent of disparities as measured by C.V. or Gini coefficients, brings forth that the inter-state disparities would have been much wider than the present level, had the developed states maintained their rates of growth during the decade 1970-71 and 79-80. It can be observed from table 16 that the rate of decline in the growth rate was much sharper for the developed states. e.g. Punjab had 40.3% decline in its growth rate, Haryana had 53.16% decline, Gujarat had 41.65% while backward states like U.P. had only 4.72% decline, M.P. had 3.41%, Bihar had 4.76% and J&K had 6.90% decline. Thus, due to sharper fall in the

rate of growth of developed states, the disparities did not increase at a faster rate. However, it would have been a healthy trend if all the states had higher rate of growth during the second decade and along with this if the disparities had come down. In India, neither, there had been an increase in the growth rate nor there had been a decline in regional disparities. This is a serious matter - which clearly reflects the regressive feature of the Indian economy.

An analysis of the position of the individual states with respect to growth rate reveals that during 1979-80, Maharashtra recorded the highest rate of growth i.e. 102.34% followed by Punjab with 90.40% growth rate. On the contrary the state of Rajasthan had the lowest rate of growth i.e. 46.47% followed by Karnataka 64.87% and Orissa with 65.76% growth rate. Performance of U.P when viewed cross-sectionally is credit worthy, as it improved its relative position from 11th placement to 3rd in the second decade, similarly, M.P. also improved its position with regard to growth rate from 9th place to 5th place. To this extent, the backward states have shown better performance during the period 1979-80. However, the absolute growth rate over two benchmark years, hardly show any positive attempt on the part of the backward states. The changes in the relative placement of some of the backward states is mainly due to sharper decline in the growth rate of the developed states and not due to an increase in the growth rate of the backward states.

Thus, in a nutshell, inspite of the increased emphasis laid on the objective of reducing regional disparities, inter-

Table 16: Growth of percapita SDP 60-61 & 70-71 & 79-80

| Sl. No. | State | 1960-61 to 1970-71 | Rank | %fall of growth | 1970-71 to 1979-80 | Rank |
|------------|----------------|--------------------------|------|--------------------|--------------------------|------|
| 1. | Andhra Pradesh | 112.36 | 7 | - 36% | 71.57 | 13 |
| 2. | Assam | 70.74 | 16 | 11.14 | 73.62 | 7 |
| 3. | Bihar | 36.97 | 14 | -4.76 | 32.83 | 6 |
| 4. | Gujarat | 129.00 | 4 | -41.65 | 75.27 | 8 |
| 5. | Haryana | 150.40 | 2 | -53.16 | 74.20 | 9 |
| 6. | J&K | 94.79 | 10 | -6.93 | 98.17 | 4 |
| 7. | Karnataka | 139.51 | 3 | -53.50 | 64.87 | 15 |
| 8. | Kerala | 119.69 | 5 | -33.62 | 73.46 | 11 |
| 9. | M.P. | 88.37 | 13 | -3.41 | 85.07 | 5 |
| 10. | Maharashtra | 97.80 | 9 | +4.64 | 102.34 | 1 |
| 11. | Orissa | 112.11 | 8 | -41.34 | 65.76 | 14 |
| 12. | Punjab | 175.00 | 1 | -40.30 | 190.48 | 2 |
| 13. | Rajasthan | 119.37 | 6 | -59.40 | 48.47 | 16 |
| 14. | Tamil Nadu | 73.14 | 5 | -5.16 | 74.11 | 10 |
| 15. | U.P. | 92.36 | 11 | -4.72 | 88.46 | 3 |
| 16. | West Bengal | 88.46 | 12 | -13.02 | 72.52 | 12 |
| 17. | Other states | - | - | - | - | |
| 18. | All India | 150.86 | - | -43.17 | 90.28 | |

state disparities have been increasing in the country. The backward states have remained backward, while the position of the developed states have also started deteriorating in terms of rate of growth of S.D.P. This trend needs to be checked immediately.

Reduction of regional disparities by checking the growth of developed regions is unhealthy. A healthy policy is one which promotes growth in all the states, encourages backward states to have higher rate of growth. This trend is badly missing in India.

In order to bring down regional disparities without impairing the national growth rate, it is essential to make an in depth study of the various problems of the backward states and to identify their potentials for further development, examine the attained levels of development, and accordingly, differential strategies need to be developed to suite the needs and capacities of the backward states. The central government can help such states through financial assistance, schemes, direct investments and so on. However, it is also important to see that the developed states continue to move ahead and are in a position to tackle the growing needs arising out of industrialisation, urbanisation and development.

Interstate Variation in Economic Growth and State Income
Inequality in India

Ravindra H. Dholakia
Department of Economics
Faculty of Arts
M.S. University
Baroda

Analysis of economic growth in state economies in India is relatively a less explored field. It assumes more importance because the state income inequality in real terms has increased during the decade 1960-61 to 1970-71 (see Ravindra H. Dholakia, 1978). The concept of state income in this context is that of income originating within given geographical boundaries of the states. It, therefore, does not reflect the welfare aspect. What it reflects is the production capacity or the efficiency aspect. The finding by itself gives rise to some important questions: (i) What is the pattern of economic growth in each State during the last decade? In other words, what is the growth experience of different States in India? Which of the factors have positively contributed towards growth and which of the factors have exercised a retarding influence on the growth of per capita income in each State? (ii) What factors are responsible in explaining the observed inter-state variations in the growth of per capita income in India? (iii) What contribution has the growth of each factor to make to the observed increase in the State income inequalities between 1960-61 and 1970-71? In other words, whether the growth of a particular factor has a favourable influence or an unfavourable influence on the State income inequalities? (iv) What is the effect of inter-state variations in the growth of different factors on the changing income inequalities in India?

Similar questions are considered by Parloff et.al.¹ for U.S.A. but their emphasis and treatment substantially differ. For a typically under-developed country like India, a few efforts have been made to probe into such questions.² They, however, do not consider all these questions simultaneously. In the present paper, too, we have to limit our analysis to only two points of time 15 major states and conventionally identified three broad sectors largely on account of non-availability of comparable and required type of data. To avoid such problems of comparison and consistency, the present paper utilizes estimates of real income, employment and real capital stock available in the author's Ph.D. thesis,³ and now available in published form in three different papers.⁴

In the next section, the contribution of different factors to the observed growth of per capita income in each state is derived on the basis of the shift share approach. Then, in the third section, an attempt is made to explain the interstate variations in the observed growth of per capita income with the help of the interstate variations in the growth of different factors. Inter-relationships among the growth of different factors in India are also examined. In the fourth section contributions of various factors in the State growth inequalities in India are derived following the deviation approach. In the last two sections, implications of the growth of different factors and the interstate variations therein on the changing state income inequalities in India are examined.

II. Growth Experience of State Economies in India : 1960-61 to 1970-71

Before we ask the question as to why the growth rates differ from one state to another, we must first of all see what leads to

the growth of per capita income in each state. The per capita income of a given state can be expressed in terms of the overall worker rate, industrial structure, capital intensity and capital productivity in the given State.⁵ It is possible to argue, therefore, that the per capita income can grow only when one or more of these factors undergo a change. It is important to note here that the changes in these variables need not always be favourable to the growth of per capita income. It is quite probable that some of the factors may change over a period of time in such a way that the per capita income may actually decline if precisely those factors turn out to be dominating in that particular State economy over the given period of time. We should therefore make an attempt to find out the exact contribution of each of these factors to the observed growth of the real per capita income of each State in India.

If we denote the per capita income of the j^{th} State in the initial year 1960-61 and in the terminal year 1970-71 at 1960-61 prices by y_j^0 and y_j^1 respectively, then, we are interested in attributing the difference $(y_j^1 - y_j^0)$ to the above-mentioned factors. Now, if w_j represents overall worker rate, x_{ij} represents capital intensity in i^{th} sector of the j^{th} State, z_{ij} represents the capital productivity in the i^{th} sector of the j^{th} State and l_{ij} represents the proportion of working force engaged in the i^{th} sector of the j^{th} State, and if o , and 1 at the R.H.S. top of the letters stand for the initial year and the terminal year respectively, then,

$$y_j^0 = w_j^0 \sum_{i=1}^n x_{ij}^0 \cdot z_{ij}^0 \cdot l_{ij}^0 \quad \dots (1)$$

and

$$y_j^1 = w_j^1 \sum_{i=1}^n x_{ij}^1 \cdot z_{ij}^1 \cdot l_{ij}^1 \quad \dots (2)$$

Now, we are in a position to obtain the expected income of the j^{th} State by following the partial approach for each factor where we assume that only that factor changes between 1960-61 and 1970-71, the other factors being held constant between 1960-61 and 1970-71.

The partial contributions of different factors generally do not add up to the exact difference ($y_j^1 - y_j^0$), hence there exists a residual representing the interactions of these factors. It is however, possible to get the exact contributions of different factors such that the residual does not exist. For this purpose, we need to derive the expected incomes of different factors by following the total contribution approach where we assume that all other factors except the one under consideration change during 1960-61 and 1970-71 and the factor under the consideration remains at the level of the initial year. The residual in this approach generally has an opposite sign as compared to the residual in the partial approach. It is now possible for us to calculate the average contribution of each of the above-mentioned factors (such that the residual does not exist) by taking the weighted average of the partial and total contributions of the same factors, weights being derived on the basis of the residuals in the two approaches. The average contributions of these factors in each state and in the total of the fifteen States are presented in Table-1.

From table-1, we can make a number of interesting observations. In the first place, we can see that the contribution of a change in overall worker rate is negative for each State without exception, though the extent of contribution varies significantly from as low as -0.80 percentage points in Punjab to as high as -15.84 percentage points in West Bengal. On an average, the change in worker

Table 1 : Growth Experience of State Economies in India - 1960-61
to 1970-71 Average Contributions of Factors

| States | Average Contribution (in Rs) of changes in | | | | Obser- ved change in PCI in Rs. | Average Contribution as Proper- tion of y_j^q (in %) of | | | | Obser- ved Growth of PCI in % |
|----------------|--|-----|------|-----|---|--|--------|--------|--------|---|
| | W | 1 | x | z | | W | 1 | x | z | |
| | | | | | $(y_j^1 - y_j^0)$ | | | | | |
| Andhra Pradesh | - 6 | - 1 | +27 | +10 | +37 | - 2.05 | - 0.34 | + 9.25 | + 3.42 | +12.67 |
| Assam | -49 | -30 | +91 | -3 | +88 | + 9 | -14.04 | - 8.60 | +26.07 | - 0.86 |
| Bihar | -26 | -30 | +91 | -40 | +51 | - 5 | -11.40 | -13.16 | +39.91 | -17.54 |
| Gujarat | -22 | +10 | +85 | -8 | +77 | +65 | - 5.91 | + 2.69 | +22.85 | - 2.15 |
| Haryana | -27 | +5 | +101 | +58 | +159 | +137 | - 7.50 | + 1.39 | +28.06 | +16.11 |
| Karnataka | - 6 | + 4 | +107 | +34 | +141 | +139 | - 1.88 | + 1.25 | +33.54 | +10.66 |
| Madhya Pradesh | -22 | - 7 | +68 | -38 | +30 | + 1 | - 8.43 | - 2.68 | +26.05 | -14.56 |
| Kerala | -22 | - 6 | +99 | -52 | +47 | +19 | - 7.86 | - 2.14 | +35.36 | -18.57 |
| Maharashtra | -32 | +13 | +118 | -95 | +23 | + 4 | - 7.94 | + 3.23 | +29.28 | -23.57 |
| Orissa | -17 | -15 | +68 | + 8 | +76 | +44 | - 7.56 | - 6.67 | +30.22 | + 3.56 |
| Punjab | - 3 | -12 | +124 | +16 | +140 | +125 | - 0.80 | - 3.21 | +33.16 | + 4.28 |
| Rajasthan | -42 | +10 | +33 | +52 | +85 | +53 | -15.05 | + 3.58 | +11.83 | +18.64 |
| Tamil Nadu | -22 | -16 | +86 | -15 | +71 | +33 | - 6.20 | - 4.51 | +24.23 | - 4.23 |
| Uttar Pradesh | -11 | - 3 | +67 | -33 | +34 | +20 | - 4.62 | - 1.26 | +28.15 | -13.87 |
| West Bengal | -70 | -20 | +153 | -52 | +101 | +11 | -15.84 | - 4.52 | +34.62 | -11.76 |
| Total | -23 | - 8 | +87 | -23 | +64 | +33 | - 7.49 | - 2.61 | +28.34 | - 7.49 |

Note : For symbols used, see the text.

Source: See the text.

rate has proved to be a major retarding factor in the growth of the per capita real income. In as many as six States, viz., Assam, Bihar, Kerala, Madhya Pradesh, Maharashtra and West Bengal, the reduction in the worker rate over the last decade caused the per capita income to grow at less than half the rate it would have otherwise grown had there not been the observed decline in the overall worker rate. Only in Punjab, Karnataka and Andhra Pradesh, the influence of worker rate was rather insignificant.

Another important thing to note from Table-1 is that the contribution of changes in capital intensity in all the States has turned out to be significantly positive. In fact, in almost all the States except Rajasthan, the per capita real income increased only because of the changes that took place in the capital intensity over the last decade. In Rajasthan, the changes in capital intensity were not so overwhelmingly important as compared to the other factors. But in five States, viz., Assam, Kerala, Tamil Nadu, Uttar Pradesh and West Bengal, the growth of per capita real income was positive only because of the change in capital intensity over the decade. Moreover, the contribution of changes in labour productivity turned out to be positive in all the States largely because of the changes in capital intensity. In only six States, viz., Andhra Pradesh, Haryana, Karnataka, Orissa, Punjab and Rajasthan, the contribution of changes in capital productivity turns out to be positive. Here also only in three States, viz., Haryana, Karnataka and Rajasthan, the contribution of changes in capital productivity was positive and significant. In these States, the growth of per capita real income also turned out to be quite high. On the other hand, in the three States, viz., Bihar, Madhya Pradesh and Maharashtra, where the growth of per capita real income

was less than one percentage point, the contribution of the changes in capital productivity was significantly negative. Only in Assam and Gujarat, the changes in the capital productivity had insignificant negative effects on the observed growth of per capita real income over the last decade.

Another important thing to note from the table is that the contribution of changes in the industrial structure in different State economies varies from -13.16 percentage points in Bihar to +3.58 percentage points in Rajasthan. Only in five States, viz., Gujarat, Haryana, Karnataka, Maharashtra and Rajasthan, the contribution of changes in the industrial structure has turned out to be positive. However, in all these five States, the contribution of changing industrial structure is quite insignificant as compared to the contributions of other factors. Actually, except Assam and Bihar in all the States, the changes in industrial structure during 1960-61 to 1970-71 has only marginal contribution towards the observed growth of per capita real income.

On the basis of the above observations, it is now possible to divide States into four broad categories of the growth pattern. The simplicity of the classification of States into only four broad categories is made possible because worker rate has exercised a retarding influence in all the State economies without exception and the capital intensity and hence the labour productivity have had a favourable influence in all the State economies without exception. Therefore, the growth pattern of different State economies differed only to the extent to which the industrial structure and capital productivity had different influences on the observed growth of per capita income. Thus, we get the following

four broad patterns of growth : (a) Favourable change in industrial structure and favourable change in capital productivity. Three States, viz., Haryana, Karnataka and Rajasthan, fall under this category. The growth experience of these three States can legitimately be compared. We find that on the grounds of structural and technological change, Rajasthan scores over the other two states, however, in terms of the capital intensity effort, Rajasthan far lags behind the other two States. Rajasthan, therefore, presents a genuine case for being taken up for rapid development if the capital intensity is carefully increased in the State without disturbing the other variables in the system significantly. A very high growth of per capita income in Karnataka, on the other hand, is explained in terms of a remarkably favourable change in the capital intensity and almost insignificantly unfavourable change in the overall worker rate.

(b) Favourable change in industrial structure and unfavourable change in capital productivity. Only two States viz., Gujarat and Maharashtra, fall under this category. A comparison of the growth experience of these two states reveals that although Gujarat experienced much less favourable effect of changing capital intensity as compared to Maharashtra, the unfavourable changes in capital productivity were quite insignificant in Gujarat while they were of the largest order in the case of Maharashtra. It is because of this reason that the growth of per capita income in Maharashtra was substantially less than the one in Gujarat. All that we can say is that there is a great need to concentrate on technological aspects in Maharashtra if the large investments should yield the desired results.⁶ More and more capital saving devices should be encouraged in Maharashtra if the growth of per capita income is to be stepped up.

(c) Unfavourable change in industrial structure and favourable change in capital productivity. Only three States, viz., Andhra Pradesh, Orissa and Punjab, fall under this category. It becomes clear when we compare the growth experience of these three States that Andhra Pradesh has experienced quite a low growth of per capita income largely on account of a substantially low contribution of changes in capital intensity as compared to the other States in India. On the other hand, both Orissa and Punjab have experienced an above average contribution of changes in capital intensity and hence their growth of per capita income turns out to be fairly high. In all these three States, the contribution of changes in capital productivity is almost negligible in absolute terms, while the negative contribution of the changes in industrial structure in Orissa cannot be regarded as insignificant. Moreover, the difference between the growth of per capita income in Punjab and Orissa can be explained by the fact that the negative contribution of changes in worker rate is almost insignificant in Punjab as compared to Orissa.

(d) Unfavourable change in industrial structure and unfavourable change in capital productivity. As many as seven States, viz., Assam, Bihar, Kerala, Madhya Pradesh, Tamil Nadu, Uttar Pradesh and West Bengal fall under this category. If we consider the growth experience of all the fifteen States taken together, it also reveals the same type of growth pattern. It is interesting to note that all the States included under this category, consistently show relatively low growth of per capita income in spite of highly favourable changes in the capital intensity over the period in some of the States. In fact, Bihar, Kerala and West Bengal experienced significantly high contribution of changes in capital

intensity, but extremely unfavourable changes in capital productivity on the one hand, and fairly high retarding effects of changes in overall worker rate on the other hand, depressed the growth of per capita real income to almost an insignificant level in these states. These are the states where systematic efforts on technological front are badly required. Instead of going in for a highly capital intensive technology, if labour intensive technology is encouraged, these States can improve their performance in terms of the growth of the per capita real income. Madhya Pradesh and Uttar Pradesh also falls more or less in line with Bihar, Kerala and West Bengal with the only difference that changes in capital intensity in the former group of States are not so favourable as compared to the latter group of States. The remedy for Madhya Pradesh and Uttar Pradesh would, therefore, be more investment in the labour-intensive techniques of production. Even among these two States, Madhya Pradesh requires greater attention not only because its growth of per capita income is almost negligible but also because the problems are acute for Madhya Pradesh on all the fronts as compared to Uttar Pradesh. The remaining two States, viz., Assam and Tamil Nadu, form a special group where capital intensity had not changed very favourably and that is how the growth of per capita income has not attained a higher level than what it has already attained. Even here, Assam seems to have been affected very adversely by unfavourable changes in worker rate and industrial structure as compared to Tamil Nadu. In both these States, however, if more investment in capital intensive techniques of production is made with a view to diversifying the economic activities in the State economies, the per capita income is most likely to grow at a faster rate than what is observed.

From the above analysis, it becomes fairly obvious that the first category of growth pattern is the best type of growth experience which was found in the case of the fastest growing States like Karnataka and Haryana. On the other hand, the fourth category of the growth pattern is the worst type of growth experience, and it is not very surprising that as many as seven States in India fall under this category. In fact, it provides us the explanation why we have not been able to achieve a rapid growth of our per capita income in spite of best of our efforts. Unfortunately, we were concentrating heavily on capital intensity neglecting almost all other factors and it is precisely the other factors which have faltered our efforts to raise the growth of per capita income. Better planning in future, with more realistic approach to the regional situations, can still make up for the loss.

III. Inter-relationships Among Growth of Various Factors

In the previous section, we have examined the growth experience of different State economies and we found there that it varies significantly from State to State. Let us now turn to examine the question what explains variations in growth of per capita income among States in India. Following the notations, we have been using, we can say

$$y_j = w_j \sum x_{ij} \cdot z_{ij} \cdot l_{ij} \quad \text{in the base year.}$$

We can remove j for the sake of simplicity from the above identity so that

$$y = w \sum x_i \cdot z_i \cdot l_i$$

Differentiating both the sides with respect to t (time), we get,

$$\frac{dy}{dt} = \frac{dw}{dt} \sum x_i z_i l_i + w \sum (z_i l_i \frac{dx_i}{dt} + x_i l_i \frac{dz_i}{dt} + x_i z_i \frac{dl_i}{dt})$$

$$\therefore \frac{dy}{dt}/y = \frac{dw}{dt}/w + \frac{w}{Y} \sum \frac{y_i}{L} (\frac{dx_i}{dt}/x_i + \frac{dz_i}{dt}/z_i + \frac{dl_i}{dt}/l_i)$$

where L is the total working force.

$$\therefore G_y = G_w + \frac{Y_i}{Y} \sum (G_{x_i} + G_{z_i} + G_{l_i}) \quad \dots (3)$$

Where G_y is the total relative growth of per capita income, G_w is the relative growth of worker rate, y_i/Y is the proportion of income originating in i^{th} sector in the base year, G_{x_i} is the relative growth of capital intensity in i^{th} sector, G_{z_i} is the relative growth of capital productivity in i^{th} sector and G_{l_i} is the relative growth of proportion of working force in i^{th} sector over the given period of time.

Similarly, we can say that

$$G_y = G_w + \sum \frac{Y_i}{Y} (G_{p_i} + G_{l_i})$$

Where G_{p_i} is the relative growth of labour productivity in i^{th} sector over the given period of time, and that $G_y = G_w + G_x + G_z = G_w + G_p$

where G_x , G_z and G_p are the relative growth of overall capital intensity, overall capital productivity and overall labour productivity. Thus we can express the growth of per capita income in a given State in terms of the growth of all the factors involved and the proportion of income originating in different sectors of the economy in the base year.⁷ Moreover, the expression is additive and hence it is all the more expected that variations in

the growth of the State per capita income should be explained by variations in one or more of the component growth factors satisfactorily. In other words, it should be possible to ascribe the variations in the growth of State per capita income to variations in growth of some of the specific variables. Table-2 presents the corresponding coefficients of correlation.

From the table-2, it becomes clear that the variations in the growth of capital productivity plays the most important part in explaining the interstate variations in the growth of per capita income in India during 1960-61 to 1970-71. The interstate variations in the growth of capital productivity in the primary sector, tertiary sector and in the economy as a whole are three out of six factors which explain a significant part of the interstate variations in the growth of per capita income. The other three factors are the growth of labour productivity in the primary sector, growth of labour productivity for the economy as a whole and growth of the overall worker rate in the State economies. All the six significant correlations are positive implying thereby that higher growth (without ignoring the sign) of these factors are on an average associated with higher growth of the per capita income and vice-versa. The interstate variations in the growth of capital productivity in the tertiary sector explains a larger proportion of the variations in the growth of per capita income than the interstate variations in the capital productivity in the economy as a whole. This probably implies that the interstate variations in the growth of capital productivity in different sectors do not follow the same pattern.

Table 2 : Correlation Between the Growth of State per Capita Income and Various Component Factors

| Component Factors | Correlation with Growth of State PCI | |
|---|--------------------------------------|--|
| | Coefficient of correlation (r) | Coefficient of Determination (r^2) (in%) |
| I. Growth of - | | |
| A. Primary Sector | | |
| 1. Proportion of Working force | -0.2212 | 4.89 |
| 2. Capital Intensity | 0.4161 | 17.31 |
| 3. Capital Productivity | 0.5744 | 32.99* |
| 4. Labour Productivity | 0.6697 | 44.85** |
| B. Secondary Sector | | |
| 1. Proportion of Working force | 0.3808 | 14.50 |
| 2. Capital Intensity | -0.1054 | 1.11 |
| 3. Capital Productivity | 0.1902 | 3.62 |
| 4. Labour Productivity | -0.3417 | 11.68 |
| C. Tertiary Sector | | |
| 1. Proportion of Working force | 0.1920 | 3.69 |
| 2. Capital Intensity | -0.4200 | 17.64 |
| 3. Capital Productivity | 0.8434 | 71.13** |
| 4. Labour Productivity | 0.3071 | 9.43 |
| D. All Sectors | | |
| 1. Overall Worker Rate | 0.5643 | 31.84* |
| 2. Capital Intensity | -0.3334 | 11.12 |
| 3. Capital Productivity | 0.8123 | 65.98** |
| 4. Labour Productivity | 0.9330 | 87.05** |
| II. Proportion in the Total SDF in the Year 1960-61 of | | |
| A. Primary Sector | 0.2077 | 4.31 |
| B. Secondary Sector | -0.1105 | 1.22 |
| C. Tertiary Sector | -0.2718 | 7.39 |

* Significant at 5% level of significance.

** Significant at 1% level of significance.

Another important thing to observe from table-2 is that the coefficient of correlation, though not significant even at 5 per cent of significance, turns out to be negative between the growth of per capita income and the growth of capital intensity except in the primary sector. This implies that higher growth of capital intensity on an average tends to be associated with lower growth of per capita income. This is an important finding because it proves that too much emphasis on the capital intensity may not always achieve the desired result of raising the growth of the State per capita income in the short run, in fact, it may have exactly the opposite effect. If at all capital intensity is increased to raise the growth of per capita income the primary sector should be given priority because the correlation between the growth of per capita income and the growth of capital intensity in the primary sector turns out to be positive in the case of India.

Moreover, we can see from the table that the growth of worker rate is significantly and positively related with the growth of per capita income. This is an illuminating finding because, it throws more light on the dynamics of the worker rate. It is believed that, in the initial stages of development, the worker rate tends to decline. All that our finding says is that the extent of relative decline in the worker rate tends to be inversely related to the growth of per capita income, because in the initial stages of development, the per capita income is likely to grow at a slow rate, on account of a high growth of population and a relatively low growth of labour productivity; while as development proceeds, the economy is likely to experience a higher growth of per capita income on account of a relatively low growth of population and a relatively high growth of productivity.⁸ It is in the early stages

of development that the economy faces significant and fundamental changes in the institutional frame-work and social traditions which, in turn, affect the worker rate in the downward direction. However, once this stage of development is crossed, the changes in the institutional frame-work and social traditions become a process and are accepted in the strides of development. On the other hand, in the initial stages of development, these changes are entirely new and hence their impact is also likely to be greater as compared to the changes in the later stages of development.

Another important thing to note from the table-2 is that it is the growth of overall labour productivity which singly explains the largest part of the interstate variations in the growth of per capita income. It implies that higher growth of labour productivity is associated on an average with the higher growth of per capita income. Thus, overall labour productivity is important not only in explaining a major part of the interstate variations in the levels of per capita income at a point of time, but it also plays an important role over a period of time, i.e. the growth of labour productivity explains a large part of variations in the growth of per capita income.⁹ At this stage we may compare the results of table-2 with the results of table-3 which provides corresponding correlations in the base year 1960-61.

First of all, only six factors, viz., capital productivity in the secondary sector, labour productivity in the secondary sector, share of the secondary sector in the total employment, labour productivity in the tertiary sector, capital intensity in the economy as a whole and labour productivity in the economy as

a whole and labour productivity in the economy as a whole, are significantly correlated with the level of per capita income in 1960-61 in India. Similarly, six factors, viz., growth of capital productivity in the primary sector and in tertiary sector, growth of labour productivity in the primary sector, growth of capital productivity in the economy as a whole, growth of labour productivity in the economy as a whole and growth of overall worker rate, are significantly correlated with growth of per capita real income between 1960-61 and 1970-71 in India. It can be seen that barring labour productivity, the two lists of factors do not coincide, which means that the set of factors important in explaining the interstate variations in the levels of per capita income in the base year is totally different from the set of factors important in explaining the interstate variations in the growth of per capita income. It was capital intensity which was important in explaining the interstate variations in the levels of per capita income, whereas it is the growth of capital productivity which is more important in explaining the interstate growth variations. Three out of six factors explaining a significant part of the interstate variations in the level of income belonged to the secondary sector, whereas none out of the six major explanatory variables for the growth of per capita income belongs to the secondary sector of the economy. The worker rate does not explain a significant proportion of the total variations in the levels of per capita income, but relative decline in the worker rate does explain a significant proportion of the total variation in the growth of per capita income. To influence the interstate growth inequality, we need to concentrate on the second set of factors rather than those factors which are important for the levels of the per capita income.

Table 3 : Correlation Between State Per Capita Income and Each of its Components, 1960-61

| Components | State Per Capita Income | | |
|------------------------------|----------------------------------|---|--|
| | Coefficient of correlation | Coefficient of Determination (%) | |
| A. Primary Sector | | | |
| 1. Capital Intensity | 0.2975 | 8.85 | |
| 2. Capital Productivity | 0.1648 | 2.71 | |
| 3. Labour Productivity | 0.4932 | 24.32 | |
| 4. Share in Total Employment | -0.3650 | 13.32 | |
| B. Secondary Sector | | | |
| 1. Capital Intensity | 0.4242 | 17.99 | |
| 2. Capital Productivity | 0.6441 | 41.49** | |
| 3. Labour Productivity | 0.7112 | 50.58** | |
| 4. Share in Total Employment | 0.5155 | 26.57* | |
| C. Tertiary Sector | | | |
| 1. Capital Intensity | 0.4618 | 21.32 | |
| 2. Capital Productivity | 0.4679 | 21.90 | |
| 3. Labour Productivity | 0.7599 | 57.75** | |
| 4. Share in Total Employment | 0.3665 | 13.43 | |
| D. All Sectors | | | |
| 1. Capital Intensity | 0.6168 | 38.05* | |
| 2. Capital Productivity | 0.2318 | 5.37 | |
| 3. Labour Productivity | 0.8624 | 74.36** | |
| 4. Overall Worker Rate | -0.2495 | 6.23 | |

* Significant at 5 per cent level.

** Significant at 1 per cent level.

Let us now turn to examine the inter-relationships among the growth of different factors in India. Table-4 gives the coefficients of correlation between growth of different factors in Indian States. The table reveals that the variations in growth of labour productivity in the primary sector are significantly explained by the variations in the growth of capital intensity as well as capital productivity in the primary sector. Both the correlations turn out to be positive. The correlations between the growth of the proportion of working force engaged in the primary sector and the growth of the labour productivity, capital intensity and capital productivity in the primary sector, turn out to be negative implying that high growth of the proportion of workers in the primary sector is associated with low growth of labour productivity, capital productivity and capital intensity in the primary sector. It should be noted, however, that all these three correlations are statistically insignificant. The correlation between the growth of capital intensity and growth of capital productivity in the primary sector turns out to be insignificant, too.

As far as the secondary sector is concerned, the variations in the growth of labour productivity are significantly explained by the variations in the growth of capital intensity and the variations in the growth of the proportion of workers in the secondary sector. The first correlation is positive, while the other one is negative. Similarly, the correlation between the growth of capital intensity in the secondary sector and the growth of the proportion of workers in the secondary sector also turns out to be negative and significant. It only implies that higher growth of the proportion of workers in the secondary sector tends to be associated with lower growth of the labour productivity and

Table 4 : Coefficient of Correlation Between Growth of Various Factors

| Growth over 1960-61 to 1970-71 of | Growth over 1960-61 to 1970-1971 of | | | | |
|--------------------------------------|-------------------------------------|--------------------------|-----------------------------|--|--|
| | Capital produ- ctivity | Labour produ- ctivity | Proportion of working force | Proportion of total SDP in 1960-61 | |
| <u>The Primary Sector</u> | | | | | |
| 1. Capital Intensity | 0.1153 | 0.5600* | -0.4517 | -0.2261 | |
| 2. Capital Productivity | | 0.8865** | -0.3222 | 0.2511 | |
| 3. Labour Productivity | | | -0.4656 | 0.0931 | |
| 4. Proportion of Working force | | | | 0.0513 | |
| <u>The Secondary Sector</u> | | | | | |
| 1. Capital Intensity | -0.3952 | 0.8773** | -0.7670** | -0.4774 | |
| 2. Capital Productivity | | -0.1593 | 0.1550 | 0.0779 | |
| 3. Labour Productivity | | | -0.8100** | -0.3588 | |
| 4. Proportion of Working force | | | | 0.2259 | |
| <u>The Tertiary Sector</u> | | | | | |
| 1. Capital Intensity | -0.6358* | -0.5999* | -0.7642** | 0.1888 | |
| 2. Capital Productivity | | 0.2067 | 0.1959 | -0.3570 | |
| 3. Labour Productivity | | | -0.7396** | -0.0985 | |
| 4. Proportion of Working force | | | | -0.0045 | |
| <u>All Sector</u> | | | | | |
| 1. Capital Intensity | -0.7567** | -0.2970 | -0.2868 | | |
| 2. Capital Productivity | | 0.8457** | 0.2969 | | |
| 3. Labour Productivity | | | 0.2316 | | |

Note : For 'All Sectors', the column (4) represents growth of overall worker rate instead of the growth of proportion of working force.

* Significant at 5 per cent level of significance.

** Significant at 1 per cent level of significance.

capital intensity in the secondary sector and vice-versa. These findings imply that Kaldor's Technical Progress Function fits well to the secondary sector of the cross-section of Indian States. The correlations between the growth of capital productivity and the growth of capital intensity and labour productivity in the secondary sector turn out to be negative though statistically insignificant. The case of the tertiary sector is much the same as that of the secondary sector with the difference that the correlation between the growth of capital productivity and growth of labour productivity is positive though insignificant, and that the correlation between the growth of capital productivity and capital intensity is negative and significant at 5 per cent level of significance which implies that lower growth of capital productivity is associated with higher growth of capital intensity in the tertiary sector and vice-versa. This suggests operation of diminishing returns in the tertiary sector.

For the economy as a whole, the growth of labour productivity is negatively related with the growth of capital intensity, however, the correlation is statistically insignificant. On the other hand, growth of capital productivity is positively and highly significantly correlated with the growth of labour productivity. Thus, growth of capital productivity is not only important in explaining the variations in the growth of per capita income, but it is also important in explaining the variations in the growth of labour productivity between 1960-61 and 1970-71 in India. Again for the economy as a whole, the growth of capital productivity and the growth of capital intensity are negatively and highly significantly correlated. The growth of worker rate is not significantly correlated with any of the three factors, viz., the growth of capital intensity, growth of capital productivity and the growth of labour Productivity.

These results are worth-comparing with those for levels where we find that (i) capital intensity and labour productivity are significantly related, (ii) capital intensity and capital productivity are not significantly related, (iii) capital productivity and labour productivity are also not significantly related, (iv) overall worker rate is significantly related with capital intensity and labour productivity. It becomes clear that there is a vast difference between the analysis of the levels and the growth of different variables. It was capital intensity and not capital productivity which explained a significant part of the interstate variations in the labour productivity, whereas it is the growth in the capital productivity and not in capital intensity which explains a significant part of the interstate variations in the growth of labour productivity. While there was no relation between the capital intensity and capital productivity in the base year, there exists a significant negative relationship between the growth of capital intensity and growth of capital productivity. Moreover, the worker rate was significantly correlated with the capital intensity and labour productivity, whereas the growth of worker rate is not significantly related with the growth of any of these factors.

IV. Contribution of Various Factors in the State Growth Inequalities in India

In the previous section, we have examined the relationship of different factors and the State per capita income growth in India. It was an aggregate analysis which was intended to throw some light on those factors which largely explain the observed variations in the growth of the State per capita income in India. In this section, let us make an attempt to measure the precise contribution of different component factors to the observed growth inequalities

of State income. Before we proceed to examine the growth inequalities of per capita income among different states in India, let us first of all see what we really mean by the term "growth inequalities". It is observed that the per capita income of different State economies in India are growing at significantly different rates over the decade (1960-61 to 1970-71). The per capita income of all the fifteen States taken together has grown by 10.75 per cent. In as much as different State economies have grown at the rate other than 10.75 per cent over the last decade, we say that there exists inequalities of the growth of per capita income among different States in India. Thus, the ideal thing from the viewpoint of the growth inequalities is that the per capita income in each State grows by 10.75 per cent over the decade 1960-61 to 1970-71.

Now, it is well-known that the per capita income grows at different rates in different States because the worker rate, industrial structure,¹⁰ capital intensity and capital productivity grow at different rates in different States. In other words, the observed growth of per capita income in a given State is due to the observed growth of these factors in that State". Similarly, for the fifteen States taken together, the observed growth of per capita income is also due to the observed growth of these factors (for the sake of simplicity, let us call the growth of a given factor for the fifteen States taken together as the 'average' growth of that factor). It is then expected that if all these factors grow at the respective 'average' rates in all the States, then, the growth of per capita income would also be the same as the 'average', unless some cross effects of the large magnitude of the growth of different factors with the differing levels of the factors take place. If these cross effects exist, (and they generally do) they represent a genuine residual which seems to be almost inevitable in the sense that we have to accept our inability to distribute it among different factors in a convincing way.

Once we accept the existence of this residual, we can find out the precise contribution of different factors in the observed growth inequalities among different States in India by following the familiar method of the partial contribution and total contribution. We should make it clear that since the initial level of income in a given State remains the same as the observed income in that State in the base year, the differences of absolute growth is reflected in the differences in the levels of income that we obtain for that State in the terminal year. Therefore, we can generate different expected incomes, for a given State for the year 1970-71 only. Our objective is to explain or distribute the difference between the observed per capita income of the given State in the year 1970-71 (y_j) and the per capita income of that State which would have been observed in the year 1970-71 had the per capita income in that State grown at the 'average' rate over the decade (Ay_j), i.e., $(y_j - Ay_j)$. When each of the component factor grows at the respective 'average' rate in the given State, the expected per capita income that we get in the year 1970-71 for the State (By_j) would be different from Ay_j , the difference being the pure residual R_j , i.e., $By_j - Ay_j = R_j$. Therefore, $(y_j - Ay_j)$ can be represented as $(y_j - By_j + R_j)$. This is necessary because conceptually, we can distribute the difference $(y_j - By_j)$ among different factors while it is not possible to distribute the difference $(y_j - Ay_j)$ directly among different factors since an inevitable residual exists.

If we accept the By_j as the basic income in the year 1970-71, for the partial contribution approach, we require to generate the expected income for the year 1970-71 in the j^{th} State such that only one factor grows at the observed rate in the j^{th} State with

all other factors growing at their respective 'average' rates during the decade.

The partial contribution of different factors, then, can be calculated by subtracting from these expected incomes the 'equal growth of component' income, i.e. By_j . These partial contribution of different factors need not exactly add upto the difference $(y_j - By_j)$ and hence a residual exists.

This residual can be removed and the exact (average) contribution of different factors can be obtained by deriving the expected incomes of the j^{th} State on the basis of the total contribution approach. These incomes for the year 1970-71 are derived by assuming that only one factor grows in the j^{th} State at the 'average' rate with all other factors growing at the actual observed rate. The total contributions of different factors are then worked out by subtracting these expected incomes from the observed per capita income of the j^{th} State in the year 1970-71. Here again a residual exists, but with the opposite sign as compared to the corresponding residual which exists in the partial contribution approach.

From these contributions it is possible to derive the exact (average) contribution of different factors by allocating the residual as described earlier. It should be noted, however, that the residual which can be distributed among different factors is the residual which belongs to the difference $(y_j - By_j)$ and not to the difference $(y_j - Ay_j)$ in which ultimately we are interested. As pointed out earlier, the residual which results as a difference between By_j and Ay_j is inevitable. Table-5 therefore, presents the exact (average) contribution of different factors to the observed State growth inequalities along with the pure residual.

Before we discuss the results of the table-5 it is necessary and important to make a clear distinction between the results of the table-1 and table-5. What we have examined in the second section above is the growth experience of different State economies. In other words, our attempt was to explain the observed growth of per capita income in a particular State over the decade in terms of the changes in different factors. We were investigating the question whether the observed change in a given factor in the given State is favourable or unfavourable for the growth of per capita real income in that State economy. In the present section, on the other hand, we are accepting the phenomenon of growth of different factors in different States and investigate the question whether the observed growth of a particular factor in the given State is favourable or unfavourable as compared to the observed 'average' growth of that factor during the last decade. Though the point of reference, viz., State incomes in the base year, remains the same in both the questions, the context of both these questions are absolutely different. In the second section, we were interested in finding out the contributions of different factors in the observed growth in a given State economy, whereas in the present section, our intention is to find out the contributions of the observed growth of different factors in the observed divergence of the growth of a given State economy from the 'average' growth. The former has the context of the observed growth experience of different State economies, while the latter has the context of State growth inequalities.

Now let us turn to examine the results of the table-5. In the first place, we can observe that the magnitude of the pure residual is relatively small except in the case of West Bengal.

Table 5 : State Growth Inequalities in India : 1960-61 to 1970-71, Absolute and
Relative Average Contribution of Factors

| States | In Rupees | | | | In per cent | | | |
|----------------|--|-----|-----|-----|--|-----|------|-------|
| | Average Contribution of the Observed Growth of W | | | | Average Contribution of the Observed Growth of W | | | |
| | W | I | x | z | p | W | 1 | x |
| Ashra Pradesh | +17 | +7 | -48 | +28 | -20 | -5 | -1 | +5.82 |
| Assam | -23 | -20 | +10 | +18 | +28 | -14 | -29 | -6.59 |
| Bihar | -10 | -24 | +33 | -24 | +9 | -5 | -30 | -4.39 |
| Gujarat | +8 | +24 | -45 | +27 | -18 | +11 | +25 | +2.15 |
| Haryana | +3 | +15 | 0 | +88 | +88 | -8 | +98 | +0.83 |
| Karnataka | +23 | +16 | +7 | +65 | +72 | -5 | +105 | +6.90 |
| Kerala | -1 | -6 | +24 | -32 | -8 | +4 | -11 | -0.36 |
| Madhya Pradesh | -4 | +3 | +4 | -20 | -16 | -10 | -27 | -1.53 |
| Maharashtra | -4 | +31 | -17 | -58 | -75 | +9 | -39 | -0.99 |
| Orissa | 0 | -11 | +15 | +23 | +38 | -7 | +20 | 0 |
| Punjab | +29 | -12 | +12 | +50 | +62 | +6 | +85 | +7.75 |
| Rajasthan | -22 | +22 | -39 | +71 | +32 | -9 | +23 | -7.89 |
| Tamil Nadu | +5 | -11 | -17 | +14 | -3 | +4 | -5 | +1.41 |
| Uttar Pradesh | +8 | +1 | +13 | -20 | -7 | -8 | -6 | +3.36 |
| West Bengal | -40 | -11 | -4 | -10 | -14 | +28 | -37 | -9.05 |

Note : For symbols used, see the text.

Source: See the text.

Moreover, no definite systematic relationship can be observed between the direction as well as the magnitude of the pure residual and any of the characteristics of different State economies. In this sense the pure residual can be regarded as random, though it is the result of the cross-effect of growth of different factors and their levels.

Another thing to observe from the table-5 is that the growth of worker rate and the industrial structure play relatively less important part in most of the States in explaining the observed deviation of the actual growth of the State economy and the 'average' growth. In seven of the fifteen States, viz., Andhra Pradesh, Assam, Karnataka, Madhya Pradesh, Punjab, Uttar Pradesh and West Bengal, the growth of worker rate plays a more important part than the growth of industrial structure in explaining the deviation; in Rajasthan, the two are equally important, while in the rest of the seven States the growth of the industrial structure is more important as compared to the growth of the worker rate. It is also illuminating to compare the contributions of the growth of capital intensity and capital productivity. In only four States, viz., Andhra Pradesh, Bihar, Gujarat and Tamil Nadu, the contribution of the growth of capital intensity is greater than that of capital productivity; in the remaining eleven States, it is the growth of capital productivity which is more dominant as compared to the growth of capital intensity in explaining the deviation. Moreover, it can be seen from the table that barring the case of West Bengal, the contribution of the growth of capital productivity is not relatively unimportant in any State. It is also worth-noting that the sign of the contribution of the growth of labour productivity and the sign of the deviation to be explained are the

same for all the States except Assam, Bihar and Gujarat. In Assam and Bihar, the contribution of the growth of labour productivity is positive and the deviation is negative, while in Gujarat it is the other way round. This only implies that a favourable growth of labour productivity implies a favourable growth of per capita income also in most of the States except Assam and Bihar; and that an unfavourable growth of labour productivity implies an unfavourable growth of per capita income in the States except Gujarat.

Another exercise to perform on the basis of the table-5 is to classify the fifteen States into various categories of favourable and unfavourable growth of factors. The classification of the fifteen States is given below in a tabular form:

| | <u>Favourable Growth of Capital Intensity</u> | | <u>Unfavourable Growth of Capital Intensity</u> |
|---|---|---|---|
| | Favourable growth of capital productivity | Unfavourable growth of capital productivity | Favourable growth of capital productivity |
| <u>Favourable Growth of Workers Rate</u> | | | |
| Favourable growth of industrial structure | Karnataka Haryana, | U.P. | Andhra, - |
| Unfavourable growth of industrial structure | Orissa Punjab | - | Tamilnadu - |
| <u>Unfavourable Growth of Worker Rate</u> | | | |
| Favourable Growth of industrial structure | - | M.P. | Rajasthan Maharashtra |
| Unfavourable Growth of industrial structure | Assam | Bihar, Kerala | - West Bengal |

* In Haryana and Orissa, the contribution of the growth of capital intensity and the contribution of the growth of worker rate respectively is zero, still we have treated them as favourable growth of the respective factors since the contribution is non-negative.

From the above classification, it becomes clear that Karnataka and Haryana have experienced a favourable growth of every factor under consideration as compared to the 'average' and hence, it is not surprising to find that these two States have also experienced the highest growth of per capita real income over the last decade. On the other hand, West Bengal is a State where the growth of each factor under consideration is unfavourable as compared to the 'average', however, West Bengal has not experienced the lowest growth of per capita real income since the extent of unfavourableness of the growth of different factors was very much less in West Bengal. Bihar which is the only State to experience a reduction in its per capita real income over the decade had only the growth of capital intensity and hence the growth of labour productivity to be favourable; the growth of every other factor in Bihar was unfavourable as compared to the 'average', especially, the growth of industrial structure in Bihar turned out to be significantly unfavourable.

It should be noted that only in six States, viz., U.P., M.P., Bihar, Kerala, Maharashtra and West Bengal, the growth of capital productivity turned out to be unfavourable. The first four of these six states are the poor States in India which have simultaneously experienced a favourable growth of capital intensity while the last two States are the rich States in India which have experienced an unfavourable growth of capital intensity also. In fact, barring the cases of Andhra Pradesh and Rajasthan, all other poor States in India have experienced a favourable growth of capital intensity, while Gujarat, Tamil Nadu, Maharashtra and West Bengal - the four better off States in India - have experienced an unfavourable growth of capital intensity over the decade. This does

not seem to be merely a coincidence, it rather seems to be due to a deliberate action on the part of the Government. If that is so, Andhra Pradesh and Rajasthan should be regarded as neglected States which demand our immediate attention because both of them have experienced a favourable growth of the capital productivity.

Before we pass on the next section, it is a worthwhile exercise to compare the above classification with the one for the levels of the factors in the base year, 1960-61. The comparison can be most systematically summarised by the factor-wise tabular classifications given below :

1. Factor : Overall Worker Rate

| <u>Favourable Growth</u> | <u>Favourable Level</u> | <u>Unfavourable Level</u> |
|----------------------------|--|--|
| | Andhra, Karnataka, Orissa, Tamil Nadu | Gujarat, Haryana, Punjab, Uttar Pradesh |
| <u>Unfavourable Growth</u> | Assam, M.P., Maharashtra, Rajasthan | Bihar, Kerala, West Bengal |

2. Factor : Industrial Structure

| | <u>Favourable Level</u> | <u>Unfavourable Level</u> |
|----------------------------|--|--|
| <u>Favourable Growth</u> | Gujarat, Maharashtra | Andhra, Haryana, Karnataka, M.P., Rajasthan, U.P. |
| <u>Unfavourable Growth</u> | Kerala, Punjab, Tamil Nadu, West Bengal | Assam, Bihar, Orissa |

3. Factor : Capital Intensity

| | <u>Favourable Level</u> | <u>Unfavourable Level</u> |
|----------------------------|------------------------------------|--|
| <u>Favourable Growth</u> | Haryana, Punjab, U.P. | Assam, Bihar, Karnataka, Kerala, M.P., Orissa |
| <u>Unfavourable Growth</u> | Gujarat, Rajasthan, West Bengal | Andhra, Maharashtra, Tamil Nadu |

4. Capital Productivity

| | <u>Favourable Level</u> | <u>Unfavourable Level</u> |
|----------------------------|--|---|
| <u>Favourable Growth</u> | Assam, Gujarat, Karnataka, Tamil Nadu | Andhra, Haryana, Orissa, Punjab, Rajasthan |
| <u>Unfavourable Growth</u> | Kerala, Maharashtra West Bengal | Bihar, M.P., U.P. |

5. Labour Productivity

| | | |
|----------------------------|---|-------------------------|
| <u>Favourable Growth</u> | Assam, Haryana, Karnataka, Orissa, Punjab | <u>Bihar, Rajasthan</u> |
| <u>Unfavourable Growth</u> | Gujarat, Kerala, Maharashtra, Tamil Nadu, West Bengal | Andhra, M.P., U.P. |

In the first place, it can be observed from the above classification that in the case of all the five factors, no block remains unfilled. The implication of this observation is that no systematic hypothesis about the level and the nature of growth of any of these five factors seems to hold except the null hypothesis. It may be the result of deliberate policy of the Government. This contention derives further support from the fact that not a single State shows favourable level and favourable growth in the case of even four out of the five factors considered above. However, Bihar has experienced unfavourable level as well as unfavourable growth in the case of four out of five factors. Probably for this reason only, the relative position of Bihar has gone from bad to worse over the last decade.

V. Growth of Various Factors and Changing State Income Inequalities in India

To investigate about the effects of growth of various factors on the changing State income inequalities in India over the last decade, we can again fall back on the total and partial approach. We are not interested in the exact contribution of the growth of different factors since our objective is to examine the overall State income inequalities, and not to explain a given deviation. For this purpose, therefore, we have to generate the expected incomes of different states by assuming that only one particular factor grows over the decade in different States (the partial approach); and that only one particular factor does not grow over the decade in different States (the total approach). Precisely these expected incomes have already been derived in the second section above.

If we calculate the Gini Coefficient of inequality for each one of these series, we get some idea about the broad contribution of the growth of each factor to the changing State income inequalities in India. The Gini coefficient for expected incomes calculated on the basis of the partial approach should be compared with the Gini coefficient for the observed State per capita incomes in the base year. If the former turns out to be greater, then the growth of that particular factor is said to be unfavourable from the viewpoint of equity in State income; and if it turns out to less, then the growth of that particular factor is said to be favourable from the viewpoint of equity in State income. On the other hand, the Gini Coefficient for expected Incomes calculated on the basis of the total approach should be compared with the Gini Coefficient for the observed State per capita incomes in the terminal year. If the former turns out to be higher, the growth of that particular factor is said to be favourable from the viewpoint of equity in State incomes because had that particular factor not changed, the State income inequalities would have been much greater in 1970-71 than what it actually turned out to be. If the former turns out to be lower, then the growth of that particular factor is said to be unfavourable from the viewpoint of equity in the State incomes. The Gini Coefficients of the expected incomes based on the partial as well as the total contribution approaches are presented in table-6.

The table clearly reveals that except the overall worker rate, the growth in each of the factors under consideration over the last decade is unfavourable from the viewpoint of the equity in State per capita income. Growth in worker rate has turned out to be favourable from the viewpoint of equity in State income. Another thing to note from the table-6 is that the least unfavourable

Table 6 : Gini Coefficients for Expected Incomes due to the Growth of Various Factors

(in per cent)

| Expected State Incomes due only to Growth of | <u>Gini Coefficient of Inequalities</u> | |
|---|---|----------------|
| | Partial Approach | Total Approach |
| 1. Worker Rate | 12.4443 | 14.5410 |
| 2. Industrial Structure | 13.7069 | 13.1325 |
| 3. Capital Intensity | 13.1851 | 14.2281 |
| 4. Capital Productivity | 13.9354 | 13.3875 |
| 5. Labour Productivity | 13.6090 | 13.3012 |
| Observed PCI in 1960-61 | | 12.9260 |
| Observed PCI in 1970-71 | | 14.3306 |

factor from the viewpoint of the equity in State income is the growth of capital intensity over the decade. This is consistently brought out in both the approaches. However, it remains a fact that, in spite of the Government policy, capital intensity in different states has grown in a way which would increase rather than decrease the State income inequalities over the decade. It should also be pointed out from the table that the case of the most unfavourable factor is not so unambiguous as the case of the least unfavourable factor from the viewpoint of equity in State income. The Gini Coefficient of inequalities with partial approach is minimum for the expected State income due to the growth of capital productivity; while the same with total approach is minimum for the expected State incomes due to the growth of industrial structure. On the basis of this observation, it can be said that, if only one factor is allowed to grow over the decade, the State income inequalities in India would have increased most, had only capital

productivity been allowed to grow; while, if only one factor is not allowed to grow over the decade, the State income inequality would have been lowest had the industrial structure remained the same over the period. At the margin, therefore, changes in the industrial structure of the State economies proved to be most unfavourable, whereas individually, the growth of capital productivity proved to be the most unfavourable factor from the viewpoint of equity in State income.

VI. Interstate Variations in Growth of Various Factors and State Income Inequalities in India

Our objective in this section is to examine the effect of interstate variations in the growth of different factors on the State income inequalities in India. The fact that different factors are growing in different States in India is accepted. The question is whether the observed growth of a given factor in different States is favourable or unfavourable as compared to the equal growth of that factor in all the States, from the viewpoint of equity in State income. For this purpose, again we can follow a sort of partial approach and total approach. We can generate the expected income in each State for the year 1970-71 such that only one factor grows at the observed rate over the decade, the other factors growing at the respective 'average' rates (partial approach); and that only one factor grows at the 'average' rate over the decade, other factors growing at the respective observed rates (total approach). Precisely these expected incomes are used in the fourth section above.

To get an idea of the effects of interstate variations in the growth of different factors on the State income inequalities, we require to calculate the Gini Coefficient of inequality for all these expected incomes and compare them with the Gini Coefficient of inequality for the observed State per capita incomes in the year 1970-71. If the Gini Coefficient for the expected State income calculated on the basis of the partial approach turns out to be greater than the one for the expected income calculated by taking the 'average' growth for each of the component factor, then we can say that the interstate variation in the growth of that particular factor is unfavourable from the viewpoint of equity in State income. Similarly, if the Gini Coefficient for the expected State incomes calculated on the basis of the total approach turns out to be less than the one for the observed State per capita income in 1970-71, then we can say that the interstate variation in the growth of that factor is unfavourable from the viewpoint of equity in State income. In both cases just described, the opposite sign of inequality between the Gini Coefficients, would imply that the interstate variation in the growth of that particular factor is favourable from the viewpoint of equity in State income. Table -7 presents the Gini Coefficient of inequality for all the above-mentioned expected State incomes along with the one for the observed State per capita real income in 1970-71.

It can be immediately seen from the table that the interstate variations in the growth of two factors viz., the industrial structure and the capital productivity, are unfavourable from the viewpoint of equity in State income. On the other hand, interstate variations in the growth of three factors, viz., the overall worker rate, capital intensity and labour productivity, are favourable

Table 7 : Gini Coefficients for Expected Income due to the Interstate Variations in the Growth of Various Factors

(in per cent)

| Expected State Incomes due only to Interstate Variations in Growth of | <u>Gini Coefficient of Inequality</u> | |
|---|---------------------------------------|----------------|
| | Partial approach | Total approach |
| 1. Worker Rate | 13.7454 | 14.5287 |
| 2. Industrial Structure | 15.3198 | 13.3359 |
| 3. Capital Intensity | 12.5492 | 16.1464 |
| 4. Capital Productivity | 15.5725 | 12.8323 |
| 5. Labour Productivity | 13.6966 | 14.8481 |
| Expected Income with 'Average' Growth of all Components | | 14.2807 |
| Expected Income with 'Average' Growth of PCI | | 12.8871 |
| Observed PCI in 1970-71 | | 14.3306 |

from the viewpoint of equity in State income. Interstate variations in the growth of capital intensity is most favourable and interstate variations in the growth of capital productivity is most unfavourable for the equity in State income. This implies that had there been equal growth of capital intensity in all the states, the State income inequality would have increased by more than what it actually has over the past decade; while had there been equal growth of capital productivity in all the States, the State income inequality would have declined instead of increasing over the past decade.

On the other hand, had every other factor grown at the 'average' rate and only capital intensity been growing at the observed rate in different states, the State income inequality would have significantly declined. This only implies that though the growth of capital intensity as such might have been unfavourable, the interstate variation therein has proved to be quite favourable from the point of view of equity in State income. Therefore, the Government policy with respect to the capital intensity was not totally faculty; in fact, it has succeeded significantly in arresting the increasing State income inequalities to its existing level in the year 1970-71. To put it differently, we can say that the Government policy with respect to the capital intensity would have yielded significant positive results in terms of achieving equity in State incomes, had all other factors grown at their respective 'average' rates in all the States. The results of table-7 also imply that the policy could not succeed visibly in reducing the State income disparities largely on account of the interstate growth variations in the capital productivity. Had the Government also taken sufficient care of the technological factors, it might have succeeded in actually reducing the State income inequalities over the decade 1960-61 to 1970-71.

The interstate variation in the growth of overall worker rate and in the labour productivity are also favourable, but their influence does not seem to be so strong, because even if interstate variations in these two factors were granted individually with the 'average' growth of all other factors, it would not have reduced the State income inequality over the decade. On the other hand, the interstate variations in growth of industrial structure is unfavourable, but here again, its influence does not seem to

be very powerful, because even when no interstate variation in the growth of industrial structure is allowed, the State income inequality does rise over the decade. These are, therefore, the marginal factors; while capital intensity and capital productivity are really the vital factors, the interstate variations in the growth of which significantly affect the State income inequalities in the terminal year. Another worth-noting thing from the table is that the State income inequalities would have marginally declined over the decade, had the per capita income in each State grown at the 'average' rate. However, if all the components had grown at their respective 'average' rates, there would not have been significant difference in the extent of the observed State income inequality. Thus, the pure residual seems to be playing an important part in the direction of raising State income inequalities.

Finally, it is important to compare the results of table-7 with the results for the level. Two factors viz., Interstate variations in industrial structure and capital productivity, are found to be unfavourable from the viewpoint of equity in the State income in the base year. The interstate variations in the growth of the same two factors were again found to be unfavourable from the viewpoint of equity in State income. The Government should pay due attention, therefore, to the structural and technological factors while taking important decision about the regional investment policy if movement towards equity in the state income in India is to be achieved in the near future.

Foot-Notes

¹H.S. Perloff, E.S. Dunn, Jr., E.E. Lampard and R.F. Muth : Regions, Resources and Economic Growth, (Baltimore : resources for the future, Inc. 1961).

²Nair K.R.G. : "A note on Interstate income Differentials in India, 1950-51 to 1960-61", in the Journal of Development Studies, Vol.7, No.4, July 1971; Ravindra H. Dholakia : "Estimates of District Income and Changing Industrial Structure in Gujarat", in Journal of Gujarat Research Society, Vol.38, July 1976.

³Dholakia, Ravindra H., Interstate Variations in Economic Growth in India, Ph.D. Thesis, M.S. University of Baroda, 1977.

⁴i) Dholakia Ravindra, H., "Comparability of 1961 and 1971 Ce Census Data - An Interstate Analysis", Anvesak, December 1977.

ii) Dholakia Ravindra, H., "Interstate Variations in Price Movement and State Income Inequality", Artha-Vikas, Jan.-June, 1980.

iii) Dholakia, B.H. and Dholakia Ravindra H., "Interstate Variations in Real Income and Capital Stock in India", Economic and Political Weekly, September 20, 1980.

⁵It is interesting to note that H.S. Perloff et.al. : Regions Resources and Economic Growth, op.cit., consider the following factors in their analysis of personal income in States of USA: worker rate, average earning per person, Industrial Structure, capital labour ratio, place of residence and marginal productivity of labour. Thus, except capital productivity, they consider almost all the factors that we consider.

⁶Some authors feel that the choice of more capital intensive technique is advantageous only if it is accompanied by more than proportionate increase in labour productivity. In other words, a rise in capital intensity should accompany an increase rather than a decrease in the capital productivity. If the choice of more capital intensive technique is to be advantageous. See, Samir Amin: "Levels of Remuneration, factor proportions, and Income Differentials with Special reference to Developing Countries", in A.D. Smith (ed.): Wage Policy Issues in Economic Development, (Mac Millan: St. Martin's Press, 1969).

⁷R.L. Pfister : "External Trade and Regional Growth : A case study of the Pacific Northwest", Economic Development and Cultural Change, Vol.11, No.2, Part I, January 1963, tests the hypothesis that "Specialization in Primary Products Means that Growth will necessarily be Slow Relative to more Industrialized Area", and finds that it is not valid in all cases. The Indian data, as can be seen from table-2, also do not support this hypothesis.

⁸ It is for such reasons, that during stage of 'take-off' the inequalities tend to increase. For further discussion, see W.W. Rostow: "The Take-off into Self-Sustained Growth", in Economic Journal, Vol.66, March 1956.

⁹ It is because of such close association between the per capita income and labour productivity, that the inter-changeable use of these two measures to reflect the level and rate of development is frequent in the literature.

¹⁰ Growth of industrial structure is very vague concept. To concretize this concept, we can take the absolute difference in the proportion of working force in a given sector over the period as proxy. Sm Kuznets has also employed more or less the same technique. See S. Kuznets : "Quantitative Aspects of Economic Growth of Nations-II", EDCC, July 1957.

¹¹ It is important to point out that most of the studies made so far emphasize the role of the industrial structure and sectoral growth only in explaining the interstate variations in the growth of labour which is taken as a proxy. See for instance, J.R. Boudeville: "A Survey of Recent Techniques for Regional Economic Analysis", in W. Isard and J.H. Cumberland (ed.) : Regional Economic Planning - Techniques of Analysis for Less Developed Area, (Paris : European Productivity Agency, 1961); A.P. Thirwall: "A Measure of the Paper Distribution of Industry" in Oxford Economic Papers, Vol.19, No.1, March 1967; J.N. Randall: "Shift-Share Analysis as a Guide to the Employment Performance of West Central Scotland", in Scottish Journal of Political Economy, Feb. 1973; R. Weed : "Regional Rates of Growth of Employment: An Analysis of Variance Treatment", in NIESR: Regional Paper .. III, (Cambridge: 1974); etc. on the other hand, those who analyse the interstate variations in the growth of income per capita, generally distinguish between effects of industrial structure and sectoral productivities only. See, for example, S. Kuznets : Quantitative Aspects of Economic Growth of Nations-II", in Economic Development and Cultural Change, Supplement to Vol.V, July 1957 and Vol.6, July 1958; G.M. Farooq: "Economic Growth and Changes in the Industrial Structure of Income and Labour Force in Pakistan", in Economic Development and Cultural Change, Vol.21, No.2, January 1973; M.D. Choudhry : Regional Income Accounting in an Under-developed Economy - A Case Study of India, (Calcutta: 1966); A.G. Green: "Regional Inequality, Structural Change and Economic Growth in Canada", in Economic Development and Cultural Change, Vol.17, No.4, July 1969; etc.

INTER-STATE INCOME DIFFERENTIALS IN INDIA,
1970-71 to 1979-80

K.R.G. Nair*

Introduction

The per capita incomes of the people of the different regions of a less developed economy are usually found to vary considerably due to a number of reasons like resource endowments, historical and sociological factors, political conditions etc. Further, as the national economy develops, the fruits of this development do not generally accrue in a regionally balanced manner. The way in which regional inequalities in per capita income undergo change during the process of national economic development has thus been of great interest to many, particularly since the 50's. The most widely prevalent view in this regard is the "concentration cycle hypothesis" argued and found empirically valid by Williamson (1965) on the basis of a detailed international study of time-series data for 10 countries and cross-section data for 24 countries. The proponents of this view hold that measures of inter-regional inequality trace out an inverted U-shaped curve over time - increasing initially to narrow down in later years. It is pointed out that the increase in regional inequalities in per capita income in the initial stages of economic development creates awareness of these inequalities and generate regional pressures necessitating deliberate policy measures to reduce them in the long run.

In the light of all this, an enquiry into the manner of change of inter-State income differentials in India for the decade 1970-71

* The author teaches Economics at the University of Delhi, South Delhi Campus.

to 1979-80, assumes particular significance. This is so because the States, which are the politico-administrative units of the Indian federation, are also to a great extent homogeneous in terms of language and culture specially since the linguistic reorganisation of States in 1956 and the creation of small hill States in the 70's. Further, while India has been planning the development of her national economy since 1950-51, surveys of regional planning in India like the one by the author (1982) have revealed that deliberate measures were initiated to remove regional inequalities in per capita income in a concerted manner only from the late 60's. Detailed studies by the author (1982), Raj Krishna (1980) and Mahajan (1982) have revealed that regional inequalities in per capita income have been on the increase in India from mid-50's to early 70's. It thus appears that till the early 70's, we were in the divergent phase of the inverted U-curve of regional disparities. But the 70's marked a turning point as regards the taking of deliberate policy measures to remove regional inequalities. The question that needs to be answered is whether these measures have been successful in making India reach the turning point also in the path of change in regional inequalities and enter the convergent phase.

The paper here attempts to answer this question. It is split into 3 parts. Part one gives the details about the data and the methodology used. Part two gives the results regarding inter-State differentials and changes in these between 1970-71 and 1979-80. Certain policy issues related to the reduction of inter-State income differentials in India are taken up for discussion in part three. The last part brings together the main conclusions that can be drawn from the analysis.

Data and Methodology

Non-availability of comparable time-series of State income in India is an important and meaningful regional studies.¹ For the period under consideration, only income originating or net domestic product (NDP) figures are available. There are two sets of such data, these being the estimates by the State Statistical Bureaus (SSB) which regularly bring out such estimates and the estimates for the years 1970-71 to 1975-76 brought out by the Central Statistical Organisation (CSO) (1979). The SSB estimates are not comparable between States because of differences in data base and methodology used, but are available at both constant and current prices. The CSO estimates on the other hand are based on uniform methodology and hence are comparable over States, but are available only at current prices ruling out inter-temporal comparisons of a detailed nature. In order to overcome this difficulty, the SSB estimates for the years 1970-71 to 1979-80 at constant 1970-71 prices and available in a compiled form in CSO are adjusted in the light of the CSO data. This is done by working out conversion factors for the year 1970-71 between SSB and CSO estimates. The conversion factor is defined as $\frac{C}{S}$ where C and S stand for CSO and SSB estimates respectively for a State. The SSB estimates for each State in each year are multiplied by the conversion factor for the State for 1970-71 in order to get adjusted SSB estimates used in the study.² Sources of other data used are given at their respective places.

Inter-State income differentials are analysed with the help of ranks, State relatives and coefficients of variation.³ The States are ranked in terms of per capita NDP over time and the matrix of correlation coefficients of these ranks over time are calculated in order to examine whether these ranks have remained

stable intertemporally. The State relative Ry is defined as $\frac{Y_s}{Y_n} \times 100$ where Y stands for per capita NDP and sub-scripts -s and n stand for State s and the nation respectively. The values of Ry are calculated for the years 1970-71 and 1979-80 with the % change in Ry between the two points of time also found out. The States are arranged in ascending order of Ry, 1970-71 and are grouped into two on the basis of the values of Ry in that year. States with $Ry < 100$ are defined to belong to group one, with the other States belonging to group two. The relationship of Ry in the initial year with the % change in Ry over time is also analysed. A similar enquiry is conducted also between the initial and the terminal triennia in order to overcome possible bias that may arise in the results due to irregular and random factors affecting two-point comparisons. The unweighted and the weighted coefficients of variation Vuw and Vw are calculated for each year and these are defined as

$$Vuw = 100 \times \sqrt{\frac{\sum_{D=1}^N (Y_s - Y_n)^2}{N}} / Y_n$$

$$\text{and } V_w = 100 \times \sqrt{\frac{\sum_{D=1}^N P_s (Y_s - Y_n)^2}{\sum_{D=1}^N P_s}} / Y_n$$

where Ps is the population of State -s, N denotes the number of States and the other variables are as already defined. Relationships between variables are analysed also by means of coefficients of correlation and multiple linear regression equations, the significance of the coefficients being tested at 5% level on the basis of the t - statistic.

Inter-State Differentials

Ranks : The States of India are ranked in terms of per capita NDP in the Appendix for the years 1970-71 to 1979-80. A number of things become apparent from these rankings. Punjab has occupied the first rank during the whole decade with Bihar occupying the lowest rank in all the years except one. In fact, Punjab, Haryana and Maharashtra are among the top four in all the years with Bihar, Uttar Pradesh, Madhya Pradesh and Orissa occupying the bottom five places. There are hardly any noticeable changes in the ranking order over time except possibly in the case of Tamil Nadu which seems to have gained and of Rajasthan which appears to be losing ground.

This stability of the ranking order over time is further substantiated by Table 1 which gives the matrix of the coefficients of correlation between the ranks of States over time. The coefficients are all positive and significant with none of them having a value less than 0.90. There also does not seem to be any tendency, however feeble, of the values of the coefficients becoming less and less, as we consider longer periods. This is in line with the findings of Hanna (1959) and Perloff (1960) that rank orders of regions change only very slowly, but is in striking contrast with the finding by the author (1982) that there are "rumblings of change" in this regard if we consider till mid 70's.

State Relatives : State Relatives, Ry, of the different States are given in Table 2 for the years 1970-71 and 1979-80. The Table also gives the % change in Ry over the period. It is obvious from the Table in which the States are arranged in ascending order of Ry in 1970-71 that the changes in Ry that have taken place are

not of a type to indicate convergence of per capita regional incomes. In a convergent phase, there should be an inverse relationship between Ry in the initial period and the % change in Ry over time with most States of group one experiencing positive changes while the reverse happens to States of group two. The largest % increase in Ry takes place in Punjab which occupies the top place in group one and the largest % decrease, in Madhya Pradesh which is the second from the bottom in group two. Further while six of the ten States of group one undergo declines in Ry, three of the seven States in group two experience increases. All this is further corroborated by the fact that the coefficient of correlations between Ry in 1970-71 and % change in it over the decade is positive and significant, being 0.57.

Nor is the picture different if we consider not just the end-points but the initial and the terminal triennia of the decades as is done in Table 3. In fact, the findings only get further strengthened. The largest % increase in Ry is in Maharashtra which leads in terms of Ry among the States of group two in the initial triennium and the largest % decrease is in Madhya Pradesh which is the third from the bottom in group one. Six of the nine states of group one experience negative changes in Ry, while four of the eight States of group two experience positive ones. The coefficient of correlation between Ry in the initial triennium and the % change in it between the initial and terminal triennia is positive and significant, the value being 0.64 which is higher than the corresponding value from Table 2.

Coefficients of Variation

The unweighted and weighted coefficients of variation of per capita NDP between the States of India are given in Table 4 for the years 1970-71 to 1979-80. The Table indicates that over the decade, inter-State differentials in per capita NDP have been on the increase, though it has not been a continuous year-to-year affair. This is so irrespective of whether we consider unweighted or weighted coefficients. All this is more apparent from the diagram plotting the values of these coefficients over time.

Findings

This analysis of inter-State differentials in per capita income in India reveals that the country is still in the divergent phase of the inverted U-shaped path. States like Punjab, Haryana, Maharashtra and Gujarat occupy all through the top four places, with the States of Bihar, Uttar Pradesh, Madhya Pradesh and Orissa being at the bottom of the ladder. There is also hardly any change in the ranking order. The results are similar irrespective of whether we consider State relatives or inter-State coefficients of variations, both weighted and unweighted.

Certain Policy Issues

The finding here that the measures taken since the late 60's to remove regional differentials in per capita income have not been such as to reduce inter-State income disparities, raises a number of interesting policy issues. It may, for instance, be pointed out that we are barking up the wrong tree and are unnecessarily confusing issues since what should interest us is the removal of poverty and not the mere lessening of inter-State inequalities in

per capita income. Another argument that may be put forth is that the resource endowments are such that it is not possible to reduce inter-state disparities by policy measures. It is the purpose of this section to examine the two arguments one by one with the help of Table 5 which gives certain relevant economic characteristics of the Indian States and for India as a whole in this regard for the year 1977-78.

Column (4) of the table gives the % of people below the poverty line in the States of India. A comparison of column (4) with column (3) giving per capita NDP data clearly brings out that there may not be a one-to-one correspondence, between per capita NDP and the prevalence of poverty.⁴ But to argue from this that attempts to lessen poverty may go against a reduction of inter-State disparities in per capita NDP, seems unwarranted. This is so because there does not seem to be any such basic contradiction as far Indian States go. In the table, the highest % population below poverty line is in Orissa which is in group one, with the lowest being in Punjab, which is on top in terms of per capita NDP in group two. Similarly in five of the nine States of group one, the % people below the poverty line is greater than the All-India value, while in group two, five of the eight States have such values less than the All-India one. All this is further strengthened by the fact that the coefficient of correlation between per capita NDP and per cent people below the poverty line is negative and significant, the value being -0.70.

The argument about resource endowments cannot be couched in terms of mineral resources since it is the mineral-rich regions of

India that are poor and many including the author (1982) have successfully shown the baselessness of such an argument. A more sophisticate version of the same may be that it is the distribution of land and population as reflected in the size of operational holdings that is a limiting factor in developing the less developed States.⁵ Column (6) of Table 5 indicates that there may be some truth in the argument. Only three out of eight States of group two have average size of operational holdings less than the All-India one, while six of the nine States of group one are similarly placed. But as against this, Rajasthan having the largest value in this regard belongs to group one and Kerala with the lowest value leads all other States of group one in terms of per capita NDP. Actually there does not appear to be any significant relationship between the average size of operational holding and per capita NDP, the value being only +0.37.

In fact if we also consider column (5) of the Table giving the index of infrastructural development, certain other things also come to light.⁶ It is apparent that infrastructural development also goes hand in hand with per capita NDP. The largest and the smallest values in this regard belong to States of groups two and one respectively. Further, while six of the nine States of group one have values in this regard less than the All-India value, only one State of group two is in this category. Kerala having the highest per capita NDP despite having the lowest average operational holding in group one is explained by its being on top of the group in terms of infrastructural development. There is a positive and significant correlation of +0.70 between per capita NDP and index of infrastructural development. There is also no significant correlation

between the average size of operational holding and the index of infrastructural development, the value being only -0.10 indicating that infrastructural development and size of holding are not necessarily related to each other. A multiple linear regression equation fitted to the data with per capita NDP, Y as the dependent variable and index of infrastructural development, I, and average size of operational holding, H, as independent variables gives the following result⁷ :

$$Y = 48.46 + 4.48 I + 78.07 H$$

| | | |
|----------|--------|---------|
| (112.61) | (0.80) | (23.77) |
| (0.43) | (5.60) | (3.28) |

Both the regression coefficients are significant and the value of $R^2 = 0.70$. The equation can thus lend further credence to the argument against resource inhibition standing in the way of meaningful measures to remove inter-State differentials in per capita NDP.

Conclusion

The study here, on the basis of available data, indicates that inter-State differentials in per capita income are on the increase in the period 1970-71 to 1979-80. Despite overt policy measures to reduce regional disparities, India thus seems to be in the divergent phase of the inverted U-shaped path of regional change. It thus seems necessary to persevere with such measures and possibly go in for more meaningful and effective ones. There does not seem to be much basis at present for the view that in doing so, one is leaving aside the important problem of the removal of poverty provided care is taken to see also that the poorer per capita income States take adequate measures to improve their large % of people below the poverty line as per capita incomes increase. Nor does it appear correct to say that there are such inherent resource endowment differences particularly in the important agricultural sector as to make planned reduction of regional disparities in per capita income an impossible task.

COEFFICIENTS OF VARIATION OF PER CAPITA GDP OF THE INDIAN STATES, 1970-71 TO 1979-80

— - - - UNWEIGHTED
- x-x-x- WEIGHTED

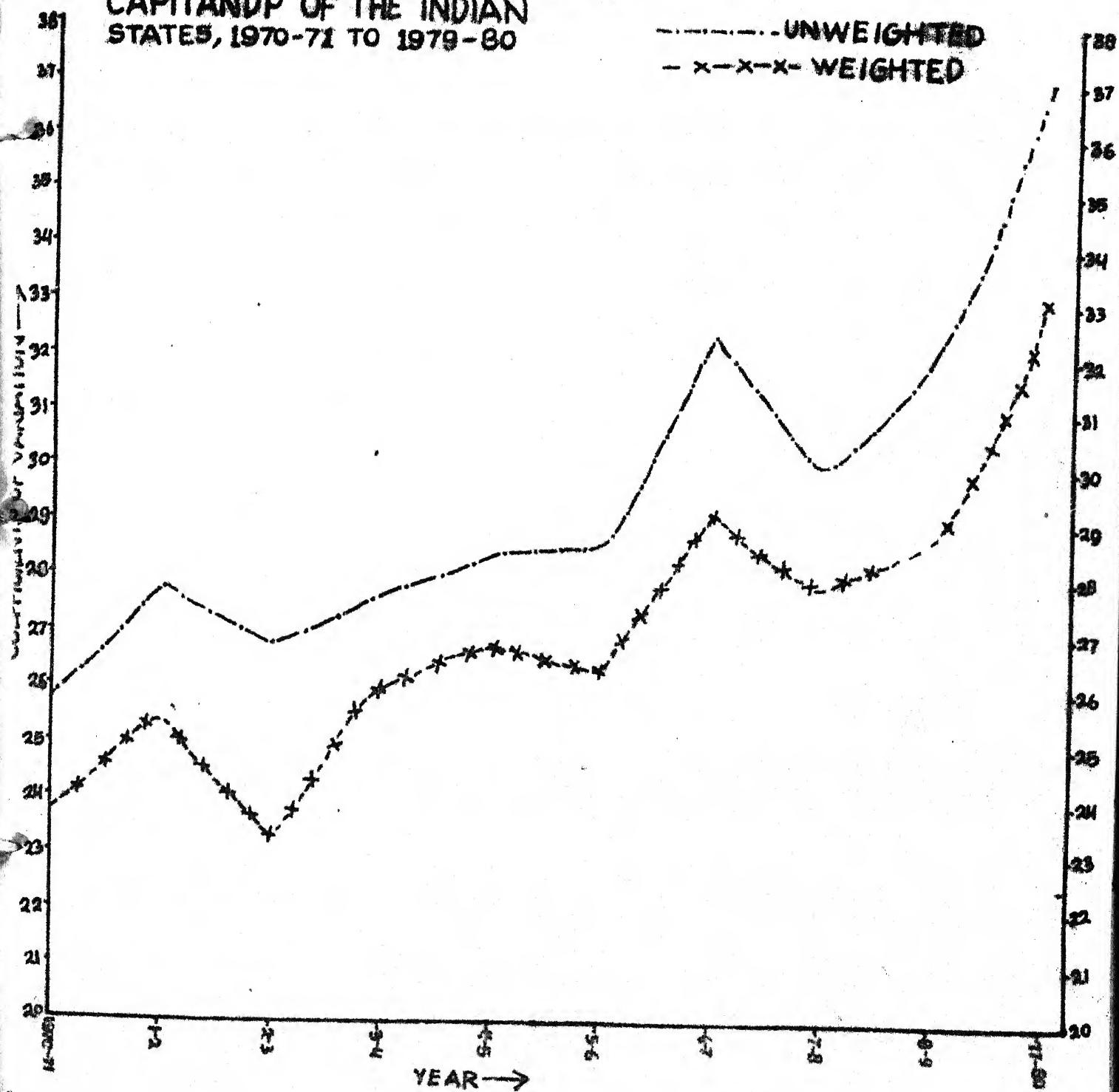


Table 1 : Matrix of Correlation Coefficients between the
Ranks of the States in Terms of Per Capita NDP
1970-71 to 1979-80*

| | 1970-71 | 1971-72 | 1972-73 | 1973-74 | 1974-75 | 1975-76 | 1976-77 | 1977-78 | 1978-79 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1971-72 | 0.97 | | | | | | | | |
| 1972-73 | 0.93 | 0.96 | | | | | | | |
| 1973-74 | 0.96 | 0.99 | 0.96 | | | | | | |
| 1974-75 | 0.92 | 0.95 | 0.94 | 0.96 | | | | | |
| 1975-76 | 0.96 | 0.99 | 0.98 | 0.99 | 0.96 | | | | |
| 1976-77 | 0.96 | 0.96 | 0.97 | 0.96 | 0.90 | 0.96 | | | |
| 1977-78 | 0.97 | 0.97 | 0.96 | 0.98 | 0.94 | 0.97 | 0.97 | | |
| 1978-79 | 0.96 | 0.97 | 0.96 | 0.98 | 0.93 | 0.98 | 0.97 | 0.99 | |
| 1979-80 | 0.92 | 0.94 | 0.93 | 0.97 | 0.90 | 0.95 | 0.95 | 0.96 | 0.97 |

*Based on ranks given in Appendix Table from adjusted SSB data at constant 1970-71 prices.

Table 2 : State Relatives, Ry. of per capita NDP 1970-71
and 1979-80*

| Sl. No. | State | 1970-71 | 1979-80 | % change in Ry |
|------------|------------------|---------|---------|-------------------|
| 1. | Bihar | 65.2 | 63.6 | - 2.5 |
| 2. | Madhya Pradesh | 76.3 | 60.0 | - 21.4 |
| 3. | Uttar Pradesh | 76.9 | 66.5 | - 13.5 |
| 4. | Orissa | 84.4 | 71.8 | - 14.9 |
| 5. | Jammu & Kashmir | 86.9 | 94.9 | + 9.2 |
| 6. | Assam | 88.9 | 85.3 | - 4.0 |
| 7. | Andhra Pradesh | 91.4 | 95.2 | + 4.2 |
| 8. | Tamil Nadu | 96.1 | 111.8 | +16.3 |
| 9. | Rajasthan | 98.1 | 79.9 | - 18.6 |
| 10. | Kerala | 99.2 | 101.8 | + 2.6 |
| 11. | Karnataka | 105.3 | 104.1 | - 1.1 |
| 12. | Himachal Pradesh | 105.5 | 97.6 | - 7.5 |
| 13. | West Bengal | 113.7 | 105.6 | - 7.1 |
| 14. | Maharashtra | 126.5 | 154.5 | +22.1 |
| 15. | Gujarat | 131.8 | 130.7 | - 0.8 |
| 16. | Haryana | 145.4 | 150.5 | + 3.5 |
| 17. | Punjab | 166.5 | 205.6 | +23.5 |

* Based on adjusted SSB data at constant 1970-71 prices. The States are arranged in ascending order of per capita NDP in 1970-71.

Table 3 : State Relatives, Ry, of per capita NDP for the triennia, 1970-73 and 1977-80*

| Sl. No. | States | Ry in | | % change in Ry |
|------------|-------------------|---------|---------|----------------|
| | | 1970-73 | 1977-80 | |
| 1. | Bihar | 66.6 | 63.8 | - 4.2 |
| 2. | Uttar Pradesh | 75.6 | 72.2 | - 4.5 |
| 3. | Madhya Pradesh | 78.7 | 67.2 | - 14.6 |
| 4. | Orissa | 81.7 | 77.8 | - 4.8 |
| 5. | Jammu and Kashmir | 88.4 | 91.6 | + 3.6 |
| 6. | Rajasthan | 88.9 | 85.3 | - 4.0 |
| 7. | Andhra Pradesh | 90.8 | 91.7 | + 1.0 |
| 8. | Assam | 92.1 | 84.9 | - 7.8 |
| 9. | Tamil Nadu | 99.7 | 105.4 | + 5.7 |
| 10. | Kerala | 102.9 | 96.6 | - 6.1 |
| 11. | Karnataka | 104.8 | 102.3 | - 2.4 |
| 12. | Himachal Pradesh | 107.6 | 102.0 | - 5.2 |
| 13. | West Bengal | 115.2 | 107.7 | - 6.5 |
| 14. | Gujarat | 124.9 | 128.4 | + 2.8 |
| 15. | Maharashtra | 125.9 | 146.4 | +16.3 |
| 16. | Haryana | 146.1 | 152.2 | + 4.2 |
| 17. | Punjab | 173.0 | 192.8 | +11.4 |

* Based on adjusted SSB data at constant 1970-71 prices. The States are arranged in ascending order of Ry for the first triennium.

Table 4 : Coefficients of Variation of per capita NDP
between the States of India, 1970-71 to 1979-80*

| Sl. No. | Year | Coefficient of Variation | |
|------------|---------|--------------------------|----------|
| | | Unweighted | Weighted |
| 1. | 1970-71 | 25.87 | 23.73 |
| 2. | 1971-72 | 27.77 | 25.36 |
| 3. | 1972-73 | 26.84 | 23.22 |
| 4. | 1973-74 | 27.64 | 25.99 |
| 5. | 1974-75 | 28.45 | 26.76 |
| 6. | 1975-76 | 28.64 | 26.39 |
| 7. | 1976-77 | 32.45 | 29.12 |
| 8. | 1977-78 | 30.70 | 27.89 |
| 9. | 1978-79 | 32.06 | 28.74 |
| 10. | 1979-80 | 37.04 | 33.34 |

* Based on adjusted SSB data on per capita NDP at constant 1970-71 prices. The weights are the averages of projected populations for the States for mid-financial years, 1974-75 1975-76.

Table 5 : Per capita NDP and General Economic Characteristics of Indian States, 1977-78*

| Sl. No. | State | Per capita NDP (Rs.) | % people below poverty line | Index of infrastru- ctural development | Average size of operational holdings** (ha.) |
|------------|------------------|-------------------------|--------------------------------------|---|--|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1. | Bihar | 446 | 57.5 | 104 | 1.1 |
| 2. | Madhya Pradesh | 513 | 57.7 | 64 | 3.6 |
| 3. | Uttar Pradesh | 524 | 59.7 | 118 | 1.1 |
| 4. | Orissa | 560 | 66.4 | 80 | 1.6 |
| 5. | Assam | 608 | 51.1 | 85 | 1.4 |
| 6. | Andhra Pradesh | 613 | 42.2 | 95 | 2.3 |
| 7. | Rajasthan | 614 | 33.8 | 74 | 4.7 |
| 8. | Jammu & Kashmir | 620 | 34.1 | 75 | 0.9 |
| 9. | Kerala | 663 | 47.0 | 148 | 0.5 |
| 10. | Tamil Nadu | 704 | 52.1 | 145 | 1.3 |
| 11. | Karnataka | 716 | 48.3 | 104 | 3.0 |
| 12. | Himachal Pradesh | 729 | 27.2 | 76 | 1.7 |
| 13. | West Bengal | 794 | 52.5 | 148 | 1.0 |
| 14. | Gujarat | 895 | 39.0 | 123 | 3.7 |
| 15. | Maharashtra | 987 | 47.7 | 113 | 3.6 |
| 16. | Haryana | 1048 | 27.8 | 148 | 3.6 |
| 17. | Punjab | 1280 | 15.1 | 207 | 2.7 |
| All India | | 695 | 48.1 | 100 | 2.0 |

* The States are arranged in ascending order of per capita NDP in 1977-78. Sources of data :

Col (3) - adjusted SSB estimates at constant 1970-71 prices.

Col (4) & (6) - Planning Commission (1981)

Col (5) - Raj Krishna (1980).

** These relate to 1976-77.

Appendix

Ranking of the Indian States in terms of per capita NDP
1970-71 to 1979-80

| Sl. No. | State | Rank in the year | | | | | | | | | |
|---------|------------------|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | 1970-71 | 1971-72 | 1972-73 | 1973-74 | 1974-75 | 1975-76 | 1976-77 | 1977-78 | 1978-79 | 1979-80 |
| 1. | Andhra Pradesh | 11 | 10 | 12 | 10 | 9 | 10 | 13 | 12 | 10 | 10 |
| 2. | Assam | 12 | 11 | 10 | 11 | 11 | 11 | 10 | 13 | 13 | 12 |
| 3. | Bihar | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| 4. | Gujarat | 3 | 3 | 6 | 4 | 7 | 4 | 4 | 4 | 4 | 4 |
| 5. | Haryana | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 |
| 6. | Himachal Pradesh | 6 | 6 | 5 | 7 | 6 | 6 | 6 | 6 | 5 | 5 |
| 7. | Jammu & Kashmir | 13 | 12 | 11 | 12 | 10 | 12 | 12 | 10 | 11 | 11 |
| 8. | Karnataka | 7 | 7 | 9 | 6 | 5 | 7 | 9 | 7 | 8 | 7 |
| 9. | Kerala | 8 | 8 | 7 | 9 | 8 | 8 | 8 | 9 | 9 | 9 |
| 10. | Madhya Pradesh | 16 | 14 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 17 |
| 11. | Maharashtra | 4 | 4 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| 12. | Orissa | 14 | 15 | 13 | 14 | 14 | 13 | 15 | 14 | 14 | 14 |
| 13. | Punjab | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14. | Rajasthan | 9 | 13 | 14 | 13 | 13 | 14 | 11 | 11 | 12 | 11 |
| 15. | Tamil Nadu | 10 | 9 | 8 | 8 | 12 | 9 | 7 | 8 | 7 | 7 |
| 16. | Uttar Pradesh | 15 | 16 | 16 | 16 | 16 | 16 | 14 | 15 | 15 | 15 |
| 17. | West Bengal | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 6 | 6 |

Footnotes

1. For critical surveys of regional income data in India, please see among others, Nair (1982), Mukherjee (1969) and Chaudhary (1966).
2. The intention is to make these constant price SSB estimates for the whole period somewhat comparable between States. There is no implication here that the CSO estimates are better than SSB estimates for all States. The assumption is, however, that the conversion factor is constant over time.
3. Many including Hanna (1959) and Perloff et al (1960) have used the concept of State relatives in regional studies.
4. It is also true that in analysing the relative positions of the States and the pattern of change in those and in inter-state disparities, it is necessary, as pointed out by the author (1982) to make a distinction between levels of living and per capita income.
5. This size is also, of course, affected by the level of development. Such arguments further ignore the differences in the quality of land. But all this doesn't disprove the fact that land endowments are fixed to a great extent.
6. The index is the one that has been calculated by the centre for Monitoring Indian Economy (1979). The components and their weights are power (20), roads (15), railways (20), postal services (5), education (10), health (4) and banking (6).
7. The figures in round and square brackets give standard errors and t-values respectively.

References

CSO, National Accounts Statistics, Government of India, New Delhi 1979, Centre for Monitoring Indian Economy, Basic Statistics Relating to Indian Economy, Vol.2, States, Bombay, 1979.

Chaudhry, M.D., Regional Income Accounting in an Underdeveloped Economy : A Case Study of India, Firma Mukhopadhyay, Calcutta, 1966.

Hanna, F.A., State Income Differentials 1919-1954, Duke University Press, Durham, 1959.

Mahajan, O.P., Economic Planning and Regional Development in India, Ess Ess, New Delhi, 1982.

Mukherjee, M., National Income in India, Trends and Structure, Statistical Publishing Society, Calcutta, 1969.

Nair, K.R.G., "Inter-State Income Differentials in India : An Empirical Study", Economia Internazionale, Vol.25, No.1, February, 1972, pp.94-106.

Nair, K.R.G., Regional Experience in a Developing Economy, Wiley-Eastern, New Delhi, 1982.

Perloff, H.S., Dunn Jr. E.S., Lampard, E.E. and Muth, R.F., Regions, Resources and Economic Growth, Resources for the Future, Johns Hopkins Press, Baltimore, 1960.

Planning Commission, Sixth Five Year Plan 1980-85, Government of India, New Delhi, 1981.

Raj Krishna, The Centre and the Periphery : Inter-State Disparities in Economic Development, Centre for Monitoring the Indian Economy, Bombay, 1980.

Williamson, J.G., "Regional Inequality and the Process of National Development", Economic Development and Cultural Change, Vol.13, No.4, Part II, July 1965.

INTER-STATE DIFFERENCES IN LEVELS AND RATES OF

GROWTH OF INCOME IN INDIA : 1951-81

Ajit Kumar Singh*
Ph.D

Since the colonial period Indian economy has been characterised by marked regional imbalances. These imbalances have become a major political issue since Independence. Consequently reduction of regional disparities has been accepted as one of the important objectives of economic policy. In this context a study of trends in regional inequalities assumes high practical importance. Although States of the Indian Union do not always correspond to a natural economic region, the discussion on regional disparities has mostly centred on inter-State differentials for a number of practical considerations. This paper presents a profile of inter-State differences in the levels and rates of growth of total and per capita output and examines the trends in inter-State disparities during the Plan period.

Nature and Sources of Data

The analysis is based on the behaviour of net State domestic product estimated at State level constant prices. While this concept does not present problems as far as the study of growth of State income over time is concerned, it is open to criticism when used for inter-State comparisons of levels of per capita income and trends therein, for which, purpose 'income accruing' rather than 'income produced' concept is theoretically preferable.

* Department of Economics, Lucknow University, Lucknow.

To what extent the two magnitudes vary is a question for empirical verification for which adequate statistical information is not yet available. The discussion of inter-State comparison is further complicated by the fact that there are differences in the methodology and quality and coverage of data for income estimation in different States. Hence the results of the study should be seen as indicative of the general trend in growth behaviour of States rather than as precise estimates of the magnitude of change.

We do not have a single time series of State income estimates for the entire period. However, NCAER has prepared Estimates of State Income at constant prices of 1960-61 for the years 1950-51, 1955-56 and 1960-61 for 14 States. These estimates have been used for the study of change during the first decade of planning. For the latter period two sets of State income estimates are available year-wise, namely, those prepared by the State Statistical Bureaux and C.S.O. The two estimates diverge from each other because of differences in methodology and data coverage. Usually the C.S.O. estimates are on the higher side. A comparison of per capita State incomes in 1970-71 on the basis of the two estimates shows that in as many as 12 States the divergence was less than 5%. In 3 States (i.e. Assam, Haryana and Tamil Nadu) the divergence was between 5.0 and 7.5 percent. Only in Orissa and Kerala the divergence was large being 12.2 percent and 14.2 percent respectively. Thus, it appears that the broad pattern of disparities and changes therein is not likely to be seriously affected, whichever series one chooses to select for purposes of study. Our study is based on the income estimates prepared by the SSBs, which covers a longer period. The same have been published in Reserve Bank of India Bulletin April 1978, June 1979 and September 1981. These are also presented in Indian Economic Statistics compiled by Ministry of Finance, Government of India.

Growth of State Income

In order to eliminate the impact of annual fluctuations we have taken the average of three years of net SDP at constant process of 1960-61 at five year intervals. The average of SDP for the years 1975-78 and 1978-81 (for which data is available only at 1970-71 pricess) has been calculated by moving the SDP for 1970-73 at 1960-61 pricess at the same rate at which the SDP has increased over this period at constant pricess of 1970-71. The absolute figures of SDP at the index with 1960-61 = 100 has been given in Table 1.

During the decade 1960-63 to 1970-73 the percentage increase in SDP has ranged from 25.2 percent in U.P. to 69.2 percent in Punjab. The States which recorded increases above the country's average during this period in descending order are : Punjab, Karnataka, Assam, Kerala, Gujarat, J & K, Haryana and Orissa. For the eighteen year period 1960-63 to 1978-81 the increase ranged from 48.3 percent in M.P. to 146.5 percent in Haryana. Apart from Haryana, SDP more than doubled over this period in the States of Punjab, Maharashtra and J & K.

Table 2 shows the annual compound growth rate of SDP over different time periods. The rates of growth vary from 2.30 percent to 4.64 percent in the fifties; from 2.07 percent to 5.20 percent in the Sixties and 1.34 percent to 5.42 percent in the Seventies. There are also differences in the pattern of growth rates in the three decades. In seven States the rate of growth in the Sixties was less as compared to the growth rates in the fifties. The decline was marked in the case of Tamil Nadu, Maharashtra, M.P., Bihar and West Bengal, but moderate in Andhra Pradesh and U.P. On the other hand, the rates of growth showed marked increase over this period in Assam, Gujarat, Karnataka, Kerala, Orissa and Punjab.

During the Seventies 7 States showed an increase in rates of growth over the past decade, i.e. A.P., Bihar, Gujarat, Haryana, J & K, Maharashtra and U.P. On the other hand there was a marked deceleration of rate of growth in this period in the States of Assam, Karnataka, Kerala, M.P., Orissa and Tamil Nadu and a moderate one in the States of Punjab, Rajasthan and West Bengal.

The States which have shown clearly above average performance in the Sixties as well as Seventies are Punjab, Haryana, Gujarat and Jammu and Kashmir. On the other hand the laggard States in both the periods are Rajasthan, U.P., Bihar, West Bengal and Tamil Nadu.

Taking the period 1960-63 to 1978-81 as a whole the States can be grouped into 4 categories according to the level of rates of growth of SDP :

- a. Very High Growth : Haryana, Punjab, Maharashtra (4.0% and above).
- b. High Growth : J & K, Assam, Karnataka, (3.25% to 4.0%) Gujarat, Kerala.
- c. Low Growth : Orissa, A.P., Rajasthan, Tamil Nadu (2.50% to 3.25%).
- d. Very Low Growth : U.P., Bihar, West Bengal, M.P.

The above discussion indicates that as far as the total SDP is concerned all States of the Indian Union have recorded clear and sustained increases, although there are significant differences in the rates of growth. Thus it appears that the forces of growth over the planning period are spread over the entire length and breadth of the country, although their impact has been uneven.

Unstability and Variability in Growth of SDP

The question of the unstability and variability in the growth of SDP may be examined now briefly. We may judge the unstability of growth process in terms of the frequency of decline of SDP. In the period of 18 years between 1961-62 and 1979-80, SDP did not register a decline in any state in 4 years only. In another 3 years the decline in SDP was confined to less than four States. In the remaining 6 years, the decline was spread to over 5 States. In particularly bad years like those of 1965-66 and 1979-80 majority of the States are adversely affected.

The variability in SDP may be measured by the spread between the lowest and highest increase in a year among States. Relevant yearwise information has been given in Table 3. The degree of inter-state variability of SDP is quite high and has increased sharply in the Sixties, though it has again somewhat declined in the post 1975-76 period.

Thus it appears that the Indian economy continues to be bedevilled by the increasing unstability and inter-state variability in the growth of SDP inspite of heavy investment in irrigation and the increased diversification of the economy. The degree of unstability appears to be high in the States of Rajasthan, Orissa, Gujarat, Karnataka and Madhya Pradesh. It is moderate in the States of Andhra Pradesh, Bihar, Haryana, U.P. and West Bengal; and low in the States of Assam, J & K, Kerala, Maharashtra, Punjab and Tamil Nadu.

Growth of Per Capita SDP

Three yearly averages of per capita SDP at constant process of 1960-61 have been calculated in the same manner as the total SDP. Relevant figures are given in Table 4. Per capita SDP ranged from Rs.220 to Rs.403 in 1960-63; from Rs.239 to Rs.499 in 1970-73 and, from Rs.251 to Rs.629 in 1978-81. During the period 1960-63 to 1970-73 per capita income declined by 1.0 percent in West Bengal. During this period marked increase took place in the per capita SDP in Himachal Pradesh, Punjab and Haryana and to a lesser extent in Karnataka and Kerala. In the Seventies increase was noticeable in case of Maharashtra, Punjab, Haryana, J & K, Tamil Nadu and Andhra Pradesh, while it was negative in Kerala and Madhya Pradesh.

For the entire period 1960-63 to 1978-81 sharp increase in per capita SDP took place in Punjab, Haryana, Himachal Pradesh and Maharashtra only. On the other hand, per capita SDP declined slightly in M.P. and West Bengal.

Annual compound growth rates in per capita SDP in different periods have been shown in Table 5. In each period there are quite marked inter-state differentials in the rates of growth of per capita income. Bihar, Madhya Pradesh and Tamil Nadu which had shown relatively more rapid rise of per capita product during the fifties, showed much lower rates of growth in the latter period. As many as 10 States showed a deceleration in the rate of growth of per capita SDP in the Seventies as compared to the Sixties, the notable exceptions being A.P., J & K, Maharashtra, Punjab and Tamil Nadu.

Table 6 presents cross classification of States according to level of per capita SDP in 1960-63 and rates of growth of SDP during 1960-63 to 1978-81. The table shows a clear relationship between the levels and rates of growth of per capita SDP. The relatively poor States of Kerala, M.P., U.P., Orissa and Bihar also showed relatively low rates of growth. Tamil Nadu, Karnataka, and A.P. fall in the medium category of both the variables. Among the rich States Punjab shows high growth, but West Bengal and Gujarat showed low growth.

Trends in Regional Disparities

Let us now see what has been the impact of inter-state differentials in rates of growth on regional income inequality. The coefficient of variation in per capita SDP declined from 28.59% in 1950-51 to 23.79% in 1955-56 and further to 21.92% in 1960-61 indicating that the first decade of planning witnessed a narrowing of inter-state income disparities. But, this trend has been reversed in the latter period as the data given in Table 6 shows.

The coefficient of variation of per capita SDP at constant process after remaining stable between 1960-61 to 1962-63 shows a clear upward trend since than which was interrupted for a short period during 1972-73 and 1973-74. A clear divergent trend in regional disparities is noticeable during the green revolution phase in the country. The divergence has been even sharpen in the Second half of Seventies. The movement of other indicators of inter-regional disparities like standard deviation, range and maximum/minimum ratio also support the hypothesis of increasing regional disparities since 1960-61.

Conclusion

The main conclusions of the study may now be briefly summed up:

1. All States of the Indian Union have registered steady increase in total SDP, though the differences in the rates of growth were quite sharp.
2. The entire period is marked by high instability and variability in growth rates which has increased over time.
3. The increase in per capita SDP have been generally low except in a few States like Punjab, Haryana, Maharashtra and Himachal Pradesh. In two States, namely, Madhya Pradesh and West Bengal, per capita SDP has actually declined.
4. An **inverse** association is observable in the levels of per capita SDP and rates of growth as a result of which inter-State income disparities have tended to widen.
5. The policy instruments devised to promote a more balanced pattern of regional development are not strong enough to arrest the divergent trend in inter-state disparities. Efforts on a much larger scale than in the past are needed to attain the objective of balanced regional development.

vka

Table 1

Net State Domestic Product at Constant Process (1960-61), Rs.: Crores

| State | 1960-63 | 1965-68 | 1970-73 | 1975-78 | 1978-81 |
|--------------------------|---------------|---------------|---------------|---------------|--|
| Andhra Pradesh | 1032 (100.0) | 1134 (109.9) | 1334 (129.3) | 1777 (172.2) | 1739 (173.4) |
| Assam | 268 (100.0) | 328 (122.4) | 408 (152.2) | 511 (190.7) | 531 (198.1) |
| Bihar | 1032 (100.0) | 1048 (101.6) | 1268 (122.9) | 1489 (144.3) | 1530 ^a (148.3) ^a |
| Gujarat | 785 (100.0) | 910 (115.9) | 1127 (143.6) | 1260 (160.5) | 1448 (184.4) |
| Haryana | 245 (100.0) | 314 (128.2) | 443 (141.1) | 556 (226.9) | 604 ^a (246.5) ^a |
| Jammu and Kashmir | 97 (100.0) | 106 (109.3) | 138 (142.3) | 173 (178.4) | 199 (205.1) |
| Karnataka | 577 (100.0) | 695 (120.5) | 908 (157.4) | 1027 (178.0) | 1104 (191.1) |
| Kerala | 441 (100.0) | 517 (117.2) | 648 (146.9) | 738 (167.3) | 753 ^b (170.7) ^b |
| Madhya Pradesh | 823 (100.0) | 865 (105.1) | 1106 (134.4) | 1269 (154.2) | 1232 (149.7) |
| Maharashtra | 1612 (100.0) | 1795 (111.4) | 2156 (133.7) | 2880 (178.7) | 3324 (206.2) |
| Orissa | 400 (100.0) | 489 (122.3) | 563 (140.8) | 622 (155.5) | 673 ^a (168.3) ^a |
| Punjab | 383 (100.0) | 501 (130.8) | 648 (169.2) | 833 (217.5) | 916 ^a (239.2) ^a |
| Rajasthan | 594 (100.0) | 639 (107.6) | 795 (133.8) | 868 (146.1) | 995 (167.5) |
| Tamil Nadu | 1120 (100.0) | 1219 (108.8) | 1486 (132.7) | 1773 (158.3) | 1791 (159.9) |
| Uttar Pradesh | 1857 (100.0) | 1963 (105.7) | 2325 (125.2) | 2641 (142.2) | 2855 (153.7) |
| West Bengal | 1348 (100.0) | 1545 (114.6) | 1696 (125.8) | 2045 (151.7) | 2027 (150.4) |
| India | 13754 (100.0) | 15748 (114.5) | 19334 (140.6) | 23394 (170.1) | 25830 (187.8) |
| Coefficient of Variation | 64.9% | 61.7% | 58.6% | 61.0% | 62.5% |

Note : a = Average for 1977-80; b = Average for 1976-80.

Figures in parenthesis show . index with 1960-61 = 100.

Table 2

Annual Rates of Growth (Compound) in SDP at Constant Prices

| States | 1950-51 to 1960-61 | 1960-63 to 1970-73 | 1970-73 to 1978-81 | 1960-63 to 1978-81 |
|----------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Andhra Pradesh | 2.61 (12) | 2.57 (13) | 3.67 (6) | 3.05 (10) |
| Assam | 2.78 (10) | 4.20 (3) | 3.30 (7) | 3.79 (5) |
| Bihar | 3.87 (4) | 2.07 (16) | 2.68 ^a (9) | 2.33 ^a (14) |
| Gujarat | 2.94 (6) | 3.62 (5) | 3.86 (5) | 3.41 (7) |
| Haryana | NA - | 3.45 (7) | 4.44 ^a (4) | 5.33 ^a (1) |
| J.K. | NA - | 3.53 (6) | 4.57 (3) | 3.99 (4) |
| Karnataka | 2.83 (9) | 4.53 (2) | 2.45 (13) | 3.60 (6) |
| Kerala | 2.84 (8) | 3.85 (4) | 2.49 ^b (12) | 3.34 ^b (8) |
| Madhya Pradesh | 4.34 (3) | 2.96 (9) | 1.34 (16) | 2.24 (16) |
| Maharashtra | 4.62 (2) | 2.91 (11) | 5.42 (1) | 4.02 (3) |
| Orissa | 2.43 (13) | 3.42 (8) | 2.55 ^a (11) | 3.08 ^a (9) |
| Punjab | 3.17 (5) | 5.20 (1) | 4.94 ^a (2) | 5.14 ^a (2) |
| Rajasthan | 2.90 (7) | 2.92 (10) | 2.80 (8) | 2.86 (11) |
| Tamil Nadu | 4.64 (1) | 2.83 (12) | 1.90 (15) | 2.60 (12) |
| U.P. | 2.30 (14) | 2.24 (15) | 2.57 (10) | 2.38 (13) |
| West Bengal | 2.63 (11) | 2.30 (14) | 2.23 (14) | 2.26 (15) |
| India | 3.24 | 3.41 | 3.62 | 3.50 |

Note : Figures in parenthesis show rank.

a = Average 1977-80.

b = Average 1976-79.

Table - 3

Variability in State Demostic Product

| Year | No. of States showing Decline | Lowest Increase (%) | Highest Increase (%) | Total Variation (%) |
|---------|-------------------------------|---------------------|----------------------|---------------------|
| 1961-62 | 4 | -1.0 | 11.3 | 12.3 |
| 62-63 | 5 | -3.1 | 9.6 | 12.7 |
| 63-64 | 2 | -7.0 | 9.3 | 16.3 |
| 64-65 | - | 0.6 | 19.9 | 19.3 |
| 65-66 | 10 | -15.0 | 3.3 | 18.3 |
| 66-67 | 3 | -8.2 | 17.2 | 25.2 |
| 67-68 | 1 | -1.0 | 20.2 | 21.2 |
| 68-69 | 5 | -19.3 | 9.0 | 28.3 |
| 69-70 | - | 2.0 | 24.4 | 22.4 |
| 70-71 | 2 | -1.7 | 34.8 | 35.5 |
| 71-72 | 3 | -10.9 | 5.0 | 15.9 |
| 72-73 | 9 | -20.3 | 5.8 | 26.1 |
| 73-74 | 4 | -4.5 | 22.4 | 26.9 |
| 74-75 | 6 | -13.9 | 9.2 | 23.1 |
| 75-76 | - | 1.6 | 28.5 | 26.9 |
| 76-77 | 9 | -12.1 | 8.3 | 20.4 |
| 77-78 | - | -2.7 | 18.1 | 15.4 |
| 78-79 | 3 | -5.1 | 9.6 | 14.7 |
| 79-80 | 13 | -16.5 | 3.0 | 19.5 |

Table 4

Per Capita SDP at Constant Prices (1960-61) in Rs.

| State | 1960-63 | 1965-68 | 1969-73 | 1970-73 | 1975-78 | 1978-81 |
|-------------------|-------------|-------------|-------------|-------------|---------------------------------------|---------|
| Andhra Pradesh | 284 (100.0) | 284 (100.0) | 304 (107.0) | 319 (112.3) | 345 (121.5) | |
| Assam | 309 (100.0) | 341 (110.4) | 343 (111.0) | 354 (114.6) | 352 (113.9) | |
| Bihar | 220 (100.0) | 204 (92.7) | 239 (108.6) | 251 (114.0) | 251 ^a (114.0) ^a | |
| Gujarat | 376 (100.0) | 383 (101.9) | 403 (107.2) | 412 (109.6) | 419 (114.4) | |
| Haryana | 329 (100.0) | 354 (107.6) | 436 (132.5) | 479 (145.5) | 502 ^a (152.6) ^a | |
| Himachal Pradesh | 259 (100.0) | 248 (95.8) | 376 (145.2) | 400 (154.4) | 386 (149.0) | |
| Jammu and Kashmir | 268 (100.0) | 273 (101.9) | 296 (110.4) | 316 (117.9) | 342 (127.6) | |
| Karnataka | 300 (100.0) | 310 (103.3) | 355 (118.3) | 365 (121.7) | 368 (122.7) | |
| Kerala | 259 (100.0) | 270 (104.2) | 301 (116.2) | 295 (113.9) | 298 ^a (115.1) ^a | |
| Madhya Pradesh | 251 (100.0) | 232 (92.4) | 262 (104.4) | 261 (104.0) | 245 (97.6) | |
| Maharashtra | 403 (100.0) | 397 (98.5) | 423 (105.0) | 506 (125.5) | 547 (135.7) | |
| Orissa | 226 (100.0) | 146 (108.8) | 254 (112.4) | 261 (115.5) | 263 ^a (116.4) ^a | |
| Punjab | 374 (100.0) | 424 (113.4) | 499 (133.4) | 562 (150.3) | 629 ^a (168.2) ^a | |
| Rajasthan | 295 (100.0) | 282 (95.6) | 310 (105.0) | 325 (110.2) | 318 (107.8) | |
| Tamil Nadu | 329 (100.0) | 322 (97.9) | 356 (108.2) | 377 (114.6) | 407 (123.7) | |
| Uttar Pradesh | 249 (100.0) | 241 (96.8) | 261 (104.8) | 276 (110.8) | 277 (111.2) | |
| West Bengal | 383 (100.0) | 388 (101.3) | 379 (99.0) | 402 (105.0) | 381 (99.5) | |
| India | 310 | 318 (102.6) | 349 (112.6) | 376 (121.3) | 389 (125.5) | |

Notes : a = Average for 1977-80.

Figures in parenthesis show - index with 1960-61 = 100.

Table - 5

Annual Compound Growth Rate in Per Capita SDP
at Constant Prices (1960-61)

| State | 1950-51 to 1960-61 | 1960-63 to 1970-73 | 1970-73 to 1978-81 | 1960-63 to 1978-81 |
|------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Andhra Pradesh | 1.17 | 0.68 | 1.56 | 1.08 |
| Assam | -0.17 | 1.04 | 0.31 | 0.72 |
| Bihar | 2.06 | 0.83 | 0.70 ^a | 0.78 ^a |
| Gujarat | 0.57 | 0.70 | 0.49 | 0.75 |
| Haryana | N.A. | 2.84 | 2.01 ^a | 2.51 ^a |
| Himachal Pradesh | N.A. | 3.73 | 0.34 | 2.22 |
| Jammu & Kashmir | N.A. | 0.99 | 1.80 | 1.35 |
| Karnataka | 0.88 | 1.68 | 0.44 | 1.12 |
| Kerala | 0.70 | 1.41 | -0.15 ^a | 0.83 ^a |
| Madhya Pradesh | 2.18 | 0.44 | -0.80 ^a | -0.13 |
| Maharashtra | 2.50 | 0.49 | 3.20 | 1.69 |
| Orissa | 0.62 | 1.16 | 0.50 ^a | 0.88 ^a |
| Rajasthan | 0.59 | 0.49 | 0.34 | 0.42 |
| Punjab | 0.87 | 2.88 | 3.30 ^a | 3.04 ^a |
| Tamil Nadu | 3.40 | 0.78 | 1.64 | 1.18 |
| Uttar Pradesh | 0.78 | 0.57 | 0.73 | 0.59 |
| West Bengal | -0.20 | -0.10 | 0.07 | -0.03 |
| India | 1.28 | 1.18 | 1.37 | 1.26 |

Note : a = upto 1977-80

Table - 6

Gross Classification of Rates According to Level
of Per Capita SDP (1960-63) and Rates of Growth
of SDP (1960-63 to 1978-81)

| Level of Per Capita S.D.P. | Rates of Growth of Per Capita SDP | | |
|----------------------------------|-----------------------------------|--|------------------------|
| | High Over 2% | Medium 1% to 2% | Low Below 1.0% |
| High (Rs.350 and Above) | Punjab | Maharashtra | West Bengal Gujarat |
| Medium (Rs.275 to Rs.350) | Haryana | Tamil Nadu Karnataka Andhra Pradesh | Assam Rajasthan |
| Low (Below Rs.275) | Jammu and Kashmir | Kerala Madhya Pradesh Uttar Pradesh Orissa Bihar | |

Table 7 : Trends in Inter-State Disparities: 1960-80

| Year | Coefficient of Variation (%) | Standard Deviation (Rs.) | Range (Rs.) | Maximum/Minimum Ratio |
|--|------------------------------------|--------------------------------|-------------|--------------------------|
| <u>Per Capita Income at (unweighted) 1960-61 Prices (N = 16)</u> | | | | |
| 1960-61 | 19.46 | 53.8 | 194 | 1.90 |
| 1961-62 | 19.07 | 58.2 | 177 | 1.87 |
| 1962-63 | 19.00 | 57.6 | 179 | 1.81 |
| 1963-64 | 20.90 | 65.0 | 185 | 1.83 |
| 1964-65 | 20.40 | 65.9 | 196 | 1.89 |
| 1965-66 | 21.35 | 63.6 | 176 | 1.80 |
| 1966-67 | 22.63 | 68.8 | 229 | 2.22 |
| 1967-68 | 22.23 | 71.8 | 258 | 2.28 |
| 1968-69 | 23.37 | 73.6 | 271 | 2.32 |
| 1969-70 | 23.99 | 79.2 | 291 | 2.41 |
| 1970-71 | 22.06 | 75.9 | 260 | 2.10 |
| <u>Per Capita Income at 1970-71 Process (N = 17)</u> | | | | |
| 1970-71 | 25.75 | 165 | 628 | 2.56 |
| 1971-72 | 27.19 | 173 | 640 | 2.57 |
| 1972-73 | 27.10 | 166 | 660 | 2.66 |
| 1973-74 | 26.91 | 171 | 697 | 2.82 |
| 1974-75 | 28.50 | 176 | 689 | 2.75 |
| 1975-76 | 28.11 | 187 | 720 | 2.74 |
| 1976-77 | 31.79 | 208 | 744 | 2.76 |
| 1977-78 | 31.15 | 218 | 802 | 2.87 |
| 1978-79 | 32.14 | 229 | 870 | 2.99 |
| 1979-80 | 36.35 | 243 | 916 | 3.26 |

Seminar on "Development and Inter-regional Disparities in India"
GIRI INSTITUTE OF DEVELOPMENT STUDIES-LUCKNOW - MARCH, 19-21, 1983.

Regional Variations in Structure of Development: A Preliminary Study based on Regional Input-output Tables in India

- K.N. Prasad
Bombay University.

1. Introduction:

Input-output tables show sectoral inter-dependence and structural basis of an economy. Leontief (1963) has propounded the use of input-output tables as an indicator of the level of development of a country. He states that though each economic system-both of developed and undeveloped economies alike - has a complicated internal structure, there are certain fundamental elements, purely of technical character, which may be found in the productive structure of modern economies. He speaks of similarity in the productive structure of developed economies. This similarity can be observed from the pattern of transactions between different sectors of the economy as revealed by the input-output tables of those economies. In consonance with the differences in the degrees of "development", the internal structure of the developing economies is distinctly different from those of the developed ones. He feels that the structure of economic development can be analysed on the basis of the comparison of the internal structure of different economies, as revealed by their input-output tables.

1.1 Basic Concepts of Structural Analysis

In the words of Leontief, dependence and independence, hierarchy and circularity (or multiregional interdependence) are the four basic concepts of structural analysis. Complete dependence or inter-dependence is revealed by an input-output table, in which all cells are invariably having non-zero entries. This means that each industry without any exception sells and buys directly from all other industries. Hence any increase in the final demand for the output of any one industry will necessitate an increase in the inputs to this sector from all other sectors. Thus single increase in direct demand will set up a whole chain of indirect demands ultimately increasing the total output of every sector in the system. However, this is only a theoretical possibility. A more likely and natural system is one in which some of the cells of the table are empty. Such tables show random industrial interdependence. The industry whose column consists of those empty cells do not draw any input from the industries represented by the intersecting rows. If the reverse combinations of column and row also reveal empty cells, then those sectors can be described as independent with respect to direct demands, though some other non-zero cells may trigger a whole chain of indirect demands, ultimately involving those directly independent sectors. (for a situation when sectors are completely independent, see (1968). However, the tables, which appear to be random in the beginning may turn out to reveal more interesting properties on rearrangement of the respective rows and columns. For example, on such rearrangement, one may obtain a triangular matrix, which

indicates that all the non-zero cells fall below the diagonal running from the upper left corner to the lower right corner of the matrix. Such matrices reveal that whole the industry in the top row purchases inputs from all other industries and sells its own output only to final users, the industry in the bottom row sells its output to all other industries as well as to final users but purchases its inputs only from itself and not from any other industry. The remaining industries in between the top and the bottom rows buy only from the industries below and sell only to industries above them. In such an economy, a change in the final demand for the output of one industry will affect only this industry and the industries below but not the industries on top of its. Hence, the computation of the indirect effects of an increase in final demand for the output of this sector requires only the input coefficients for sectors below it. On the other hand, the sectors on top of it only purchase outputs of this sector. Hence, an increase in final demand for the output of any one of the above sectors will generate indirect demand for the output of the sector in question. Thus, the computation of the indirect effects on this sector of final demand originating elsewhere, requires looking into the input coefficients for this sector and the sectors above it. Thus, such triangular matrices reveal a complete hierarchical inter-industry relation. In the case of a block triangular matrix depicting circularity, relations between sectors within each block are similar to the case of mutual inter-dependence in which all cells within the block have non-zero entries, meaning thereby that each industry in the block buys from and sells to each other without

any exception, whereas relations between the blocks (multiregional interdependence) are similar to those between the sectors in the triangular model, i.e. of hierarchical or unidirectional interdependence in which the top block buys from the bottom block, but not the other way round. Thus, by discovering a way of numbering a given matrix such that it becomes a triangular or block triangular, one may unearth a hidden ordering in the relation among industries.

1.2 Earlier Empirical Studies

Leontief (1963) in his study discovers that the input-output tables of the U.S. and Western Europe unearth the same triangulation. According to him the U.S. European input-output table constitutes the structure of a fully developed economy. He thus defines an economy under developed to the extent "that it lacks the working parts of this system". He speaks of the importance of actual numerical magnitude of the entries, composition of the foreign trade of the country and the fineness of the sectoral breakdown for the triangulation of a real input-output table to compare its level of development vis-a-vis that of the U.S. and the Western Europe. He does this sort of analysis for Israel's economy by triangularising its table similar to the U.S. - Western European table. He then compares it as well as Egypte and Penuls levels of development vis-a-vis the U.S. and Western Europe by constructing a model of the economy likely to appear in the case of self-sufficiency (see methodological details in Leontief's study) and on the basis of the ratio of agriculture to total economic activity. These comparisons reveal a striking hierarchy. Thus, he speaks

of the importance of triangularisation in the dynamic sense as well, because he discerns that as an economy passes through different phases of its development, "block reaction" will so change the respective position of different blocks that low blocks will grow tall and the presently dominating blocks will lose their existing stature.

The technique of triangularisation has been applied in other studies for international comparisons by Chenery and Watanlie (1958) and Simpson and Tsukui (1965). Strict triangularity could not be found in either of the two studies. However, by rearranging the rows and columns of the input-output tables of the developed economies like Italy, Japan, Norway and the United States, Chenery and Watanbe found such a high degree of triangularity that the percentage of transactions above the diagonal were in the range of two to six percents. They mention in a footnote of the first experiment with triangular input-output matrices to have been done by Wood and Horten (1950). Wood and Horten's model, in their words, comprised forty sectors, which individually had an (unweighted) average ratio of elements above the diagonal to the final demand to the extent of 5 per cent. For applying this technique to the tables of the U.S. (1947) and Japan (1955), Simpson and Tsukui (1965) had aggregated the two tables to equal number of sectors and compared coefficients rather than flows to mitigate the influence of final demand, but could not eliminate the influence of differences in relative prices. They could succeed in triangularising the two tables by setting all technical coefficients which are less than 1 (number of sectors) to zero. The two triangularised tables were strikingly alike in the

sense of having block independence and triangular properties. These similarities were not dependent on a particular method of aggregation. This was discovered by finding the same fundamental structure with respect to the tables of Norway, Italy, and Spain, based on different sectoral classification by arranging the industries in an order as close to that obtained in the triangularised tables for the U.S. and Japan. Arranging the industries of each economy into four blocks, namely, metals, nonmetals, energy and services, with the exception of services, their study revealed a fundamental structure of production by a matrix which is generally block and triangular in form, these blocks are composed of metal industries, non-metal, energy and services. Though the matrices which they had derived revealed more closely a triangular pattern than a block pattern, they emphasised the block-pattern. Hence, they did not rearrange the sectors, though that could have improved the triangularity. Ernst Halmstadtern (1969) triangularised matrices of 36 countries for different years ranging from 1919 to 1960 with number of sectors varying from 6 to 38 on the basis of the criterion to maximise the sum of the above diagonal entries. In triangularised matrices, transaction flows were largely unidirectional and mutual transactions were comparatively weak. They, thus, revealed a high degree of linearity, which was defined by Helmstadter as the percentage ratio of the sum of above-diagonal entries to the total sum of interindustrial transactions. He found that the degree of linearity was negatively correlated with the degree of aggregation. However, he could not conclusively prove a

systematic relationship between the level of industrialisation, because his results showed that whereas some of the less industrialised countries had high a few industrialised countries had low . However, yan (1968) feels that by rearrangement of metrices of developed countries in the form of below diagonal triangularisation, it can be shown that heavy industries are primary or basic industries and are located at the base rows of the triangularised matrix being indispensable for the production in all sectors of the economy. Watanbe Chenery (1958) have suggested classification of industries as a basis for development analysis. Defining u_j as the ratio of total purchase of intermediate input by industry j to the total output of industry j , i.e.

$$u_j = \frac{\sum_{i=1}^n x_{ij}}{\sum_{i=1}^n x_i}$$

and w_i as the ratio of total sales of intermediate industry product by industry i to the total output of i , i.e.

$$w_i = \frac{\sum_{j=1}^n x_{ij}}{\sum_{j=1}^n x_j}$$

(with high u_j) and primary (with low u_j) on the input side and intermediate (with high w_i) and final (with low w_i) on the output side. Thus, according to them, all industries in the economy both on input and output sides can be classified into

two categories:

the following four groups:-

| Input / Output (High W_i) | Intermediate Manufacturing | Final Manufacturing (low W_i) |
|---------------------------------------|---------------------------------------|--|
| Manufacturing (High U_j) | Intermediate Manufacturing | Final Manufacturing |
| Primary Production (low U_j) | Intermediate Primary Production | Final Primary Production |

In the framework of this classification scheme, a developed economy is likely to be associated with the production of a large number of goods belonging to intermediate manufacturing group and a primary and underdeveloped economy with final primary goods. The same pattern can be discernable from the pattern of export and import of an economy. The reason for this is that there is a "roundaboutness" of production in developed economies, which is associated with a large amount of intermediate goods, because in those countries a good passes through various production processes and producers before it reaches final consumers.

Yan and Ams (1965) have suggested a method to χ quantity such "roundaboutness" by an overall average index of "economic interrelatedness" based on indices of "overall interrelatedness" of different industries. This involves making use of iterative elements of Leontief inverse matrix comprising successive square elements of the input-output coefficients matrix (since $(I-A)^{-1} = I + A + A^2 + \dots$) till they become negligible. In this approach, elements having non-zero values in A matrix are denoted by

number -1, representing first-round order of relatedness.

Those elements which get non-zero values in A^2 for the first time are denoted by number 2, representing second round order of interrelatedness and so on. Elements having zero values through out the interative procedure are denoted by D_1 representing complete absence of any relatedness between the concerned pair of industries. Then an order matrix, namely, R , is constructed. This comprises only either -1 or numbers ranging from 1 to n, depending upon the order of relatedness. Thereafter, in order to evaluate the interrelatedness of industries on the output side, reciprocals of the elements in a row of the order matrix are averaged. Similarly, interrelatedness of industries an input, side is calculated by the column averages of reciprocals. In case, row average is closer to one, the industry is considered as important supplier of intermediate output, on the other hand; if column average is closer to one, it indicates that the industry represented by the column is an important user of the output of various industries. By averaging column average and row average, of an industry an index of the "overall interrelatedness" of that industry can be calculated. Furthermore, by taking an overall average of these industry indices, an index of "economic interrelatedness" for the economy as a whole can be derived. In their evaluation of the index of economic interrelatedness for the U.S. economy, they found that it was 444 for the year 1919 and 536 for the year 1929. This led them to conclude that technical coefficients shift over time and are mainly determined by technical conditions rather

than resource structure.

1.2.1 Soviet Studies

With a view to making use of these techniques for the analysis of soviet economy during 1923-24, the period of New Economic Policy, Dolan (1967) first recasts the data of the Balance (See Nicholas Spulber (1964) for the introductory chapter of the Balance) in the form of input-output tables, Feling that the ordering of maximum triangulation does not carry any particular economic interpretation, he combines the study of triangularity with that of block-independence. For this purpose, he divides the 20 sector input-output table of 1923-24 into five groups, namely (i) Industrial non-metals (ii) Agricultural Complex, (iii) Industrial metal (iv) Energy and (v) Services. Thereafter, he triangulated the matrix, subject to the constraint that the blocks remain intact. He finds such a high degree of triangularity of production both within the blocks and for the matrices as a whole that more than 91% of the sum of all entries in each case is concentrated on or below the diagonals. Besides, like Simpson and Tsukui, he also finds high degree of block-independence with the exception of the service block. He also studies the structure of the 1923-24 Soviet economy by using Man-Ames index (see, Dolan's study for methodological details). His study reveals that agricultural complex was so much isolated from the rest of the economy that the indices of dependence of agriculture on industrial non-metal was only 0.08 and on heavy industry comprising metal and energy only 0.10, which are not only the

lowest in the table but also for below the index of 0.27 for the table as a whole. On the other hand, the table reveals such a key importance of heavy industry sector in supplying inputs to all industries that industrial non-metal sector's index of dependence on heavy industry sector was 0.41 and the latter's index of intradependence 0.50. However, he does not present the index of economic interrelatedness, as defined by Yan and Ames. The studies by Gillula (1975, 1977), not only show the triangular form of the 86 sector input-output table for Soviet Union for 1966, but also the degree of linearity.

Following Helmstadter's methodology 91.83% and the degree of economic interrelatedness, R, following Yan and Ames's methodology 0.896. These values show that there is a relatively strong one way interdependence of sectors in the Soviet economy.

1.2.2 Indian Studies

Turning to Indian studies, Santhanam and Patil (1972) follow the methodology of Chenery and Watanbe to compare the structure of production, patterns of intermediate use of commodities and input coefficients of India with advanced countries like Italy, Japan, Norway and the United States. They show that irrespective of differences in resource endowments and the level of economic development. The similarities in the structure of production exist with respect to India and those advanced countries, which were earlier discovered to be existing among the latter countries by Chenery and Watanbe. As

Santhanam and Patil argue that the diversified pattern of production, especially of manufacturing sectors, puts India in a category different from other underdeveloped countries, it can be concluded that Santhanam and Patil's study confirms both Leontief's view that regardless of resource structures, the developed countries reveal similar technical coefficients and Simpson and Tsukui's contention of the existence of a fundamental structure of production, especially among developed countries. Manne, Rudra and et.al. (1965) noticed that the 30 sector input-output table for the Indian economy for 1960-61 revealed such block-angularity that the whole table can be divided into three groups, namely (i) Mining, metals, machinery and construction (ii) Food and fibre production and processing and (iii) universal intermediates, comprising motor transport, petroleum products, crude oil, rubber products, rubber, chemicals, railways, electricity and coal. They feel that it would be interesting to know whether similar block - angularity exists for other developed countries and mention in the footnote that according to Karl Fox (1962) a similar structure is true for the U.S.A. as well. The search for block angularity is extended further by Lakdawala, Alagh and Sarma (1972), who make use of clustering techniques to derive "Empirical spatial clusturs" and "technological clusturs". (see, Lakdawala, Alagh and Sarma (1972) for methodological details). For "Empirical spatial clusturs" those industries are clustered into such sets of industries, which have developed simultaneously in the past and for "Technological clusturs" Indian industries are put into self-sufficient

"blocks" of industries in terms of block interdependence on the basis of input purchases and output disposal. In the regional context, Alagh, Kashyap and Desai (1972) modify Mukerjee's method (1970) and use sectoral linkages as a criterion for aggregation and decomposition of sectors of Gujarat's table of 1964-65. Similar exercise for Rajasthan's Industrial Economy has been done by Bohra and Mehta (1971).

2.0 Objective of the present study

The earlier empirical studies show that whereas Leontief's (1963), Simpson and Tsukui's (1965) and Chenery and Watanbe's (1958), reveal that there is a remarkable similarity in the input-output relations among countries, especially developed ones irrespective of their resource structures and dissimilarity between developed and developing ones. This leads Leontief to contend that there is only one recipe for modern technology and an underdeveloped economy can be defined as underdeveloped to the extent that it lacks this recipe. Helmstadter's (1969) study shows that there is negative correlation between the degree of aggregation and the degree of linearity and Yan and Ames's (1965) study shows the temporal shifting and intensification of the degree of interrelatedness, leading Yan (1968) to concur with Leontief's view that input-output coefficients are determined by technical conditions rather than resource structure and the variations in the productive structure of an underdeveloped country from that of developed country shows the former's failures to adopt modern technology. Besides, the

review also shows the absence of any regional study in India comparing regional variations in structure of development in input-output framework. Thus, in the present study, we have tried to triangularise few of the available regional input-output tables in India and classify the original tables in accordance with Chenery and Watanbe's classification scheme with a view to verifying whether the triangularised tables and the different categories in which specific sectors of different regions are put conform to their existing levels of development.

3.0 Approach of the present study

Initially, we tried to triangularise a number of input-output tables in their original form with a view to maximising the number of entries and their values on the left hand side of the respective diagonals. However, our exercise conformed to the findings of the earlier studies that original tables in full can not be triangularised satisfactorily. We, therefore, first identified those sectors which have such large values that they together provide 90% or more of the total inputs for a particular sector and also these sectors which together use 90% or more of the output of a particular sector for inter industry consumption. We have considered all those sectors which are important on both these counts or on any one of the two counts. This exercise has been done for each of the concerned tables. We then triangularise these tables with the objective of maximising entries and values on the left hand side of the diagonal. Following the cue from Simpson and Tsukui's study, we encircle

each of those entries whose values are greater than $1/n$ with a view to neglecting them while analysing the salient features of these triangularised matrices. For classifying sectors in accordance with Chenery and Watanbe's approach, we first find out for each sector, the ratio of purchased inputs to total output, i.e.

$$\frac{u_j}{x_j} \quad i \quad x_{ij} \quad \dots \dots \dots \quad (1)$$

and the ratio of intermediate consumption to trial output, i.e.

$$\frac{w_i}{x_i} \quad j \quad x_{ij} \quad \dots \dots \dots \quad (2)$$

and then adopt this u_j w_i classification scheme to categorise any sector as manufacturing, for which $u_j < 45$ and primary for which $u_j > 45$ on the basis of input use and as intermediate for which $w_i < 45$ and final for which $w_i > 45$, on the basis of inter-industries consumption. Thus, we have two fold classification, according to which any sector with $u_j < 45$ and $w_i < 45$ is turned as Manufacturing intermediate, $u_j < 45$ and $w_i > 45$ as manufacturing final, $u_j > 45$ and $w_i < 45$ as Primary intermediates and $u_j > 45$ and $w_i > 45$ as Primary final.

4.0 Data Base for the present study

With the table for West Bengal for 1958, there are altogether nineteen regional tables, which are constructed for

different regions in India (for a Survey of these tables, see Prasad and Dalvi (1982). Quite a few are only for industrial sectors. Most of the remaining tables are constructed at the respective regional centres and have used the data available at these centres and also the results of the various surveys conducted there for constructing these tables. Since all the tables are not available, we have been able to use the following tables. Assam (1969), Bihar (1969-70), Gujarat (1964-65) comprising (i) 24 sectors (ii) 15 sectors, 1969-70 - comprising 15 sectors). Haryana (1969-70), Maharashtra (1963), Punjab (1969-70), Rajasthan (1970-71), U.P. (1970-71) and West Bengal (1958). Gujarat's table for 1964-65 has been considered not only in its original 24 sectors form, but also aggregated into 15 sectors to make it comparable with the 1969-70 table. The idea is to verify Hamstedler's contention that the degree of linearity is affected by aggregation. Thus we have considered altogether 3 tables for Gujarat. Though the number of sectors in different tables and the date for which the respective tables are constructed are not uniform, taking the cue from Hemstadter's methodology, we have not made any adjustment to make them uniform. In our empirical analysis, we are examining whether these diversities affect the results in any significant way.

Though the regional tables for 1965 constructed uniformly at both producer's and mix prices in accordance with the same classification scheme have both the sectoral and valutional uniformities, but being constructed at one centre and being based on all-India norms in the case of non-availability of published data, these tables have not been able to capture the technological characteristics of different regions. As the object of this study is to examine the technological characteristics of the production structure of different regions in India, the GIPE regional tables have not been used for

5. Empirical Results and Analysis.

Triangularised matrices at 90% level are presented in Appendix Tables 1.1 to 1.11. The characteristics of these tables have been summarised in Table 1. This table gives the name of the region, year for which the table is constructed, no. of entries on the right hand side of the diagonal with values of the coefficients greater than $\frac{1}{\text{Total no. of sectors}}$ percentage of such entries to total no. of entries in the table, percentage of values of such entries to total value of all the entries in the table, sector number of those sectors largely in the top rows of the table for which there are only 0 or 1 entry and sector number of these sectors in the bottom rows of the table which are having largest number of entries. Percentage of entries on the right hand side of the diagonal to total number of entries and percentage of values of such flows to total flows in the table being subtracted from 100 will give the degree of linearity both in terms of numbers and values respectively. The table reveals that the percentage of entries on the right hand side of the respective diagonals to the total no. of entries is less than 5 in the case of Assam, the 1969 table Gujarat and Punjab. The tables for Gujarat for 1964-65 both with 24 and 15 sectors respectively do not have any entry on the right hand side of the diagonal. It shows that aggregation has not affected the degree of linearity in this case. Whereas similar percentages for Haryana, Rajasthan, U.P. and West Bengal are less than 10, it is as high as 13.43 in the case of Maharashtra and 14.67 in the case of Bihar. In the case of Bihar, inputs from large number of sectors for Railway transport, other transport and trade margins account for a large number of entries on the right hand side of the diagonal. As input coefficients for these sectors are largely borrowed from All-India tables (see Prasad and Dalvi (1982)

of data for the latter tables are them-

selves not very satisfactory, the high percentage of entries on the right hand side of the diagonals reflect the shortcomings of the data rather than technological variations in their structure of development. But for the data problem with the sole exception of Maharashtra, all the tables are highly triangularised, showing quite high degrees of linearity, which are 100% for Gujarat's 1964 tables, more than 95% for Assam, Gujarat-1969 and Punjab, more than 90% for Haryana, Rajasthan, U.P. and West Bengal and more than 85% for Maharashtra and Bihar. If we look at the column showing name of the sectors whose no. of entry is 0 or 1, these sectors include not only consumption goods like Sugar and Gur, Tea, Cotton textiles, Jute Textiles, Grain and Oil milling, Milk food, Dairy Products, Furniture and Fixtures, and Cigar and Cigarettes. (Construction belong to this category, because of the data problem (see, Prasad, Dalvi, (1982), but also Rail road equipments, non-ferrous metals, bolts and nuts, crude oil, Iron and Steel for Assam, Rail road equipments, Motor Cycles and Bicycles, Surgical and Scientific Equipments for Haryana, Rail road equipments, and machinery except electrical for Punjab, Rail road equipment and motor cycles for Rajasthan, Iron ore and Transport equipment for Bihar. As some of these industries are heavy industries and then resource based commodities like Grude Oil in Assam and Iron Ore in Bihar, the fact that all these are combined with consumption goods industries, it shows that there is not much technological variations in the structure of development of all these states. This factors largely collaborated if we look at the column showing the name of the sectors with largest number of entries, which shows that but for electricity, which is being used in many industries in all the states, only in a few cases highly chemicals processed inputs are being used in large number of industries and chemicals in the case of Gujarat 1964 (24 sectors) including Fertiliser in the case of Punjab, Coal in the case of

Assam and West Bengal, Petroleum products in the case of Assam, Gujarat, Maharashtra, Basic metal industries in the case of Haryana and metal products in the case of Haryana and Maharashtra are being used in many different industries. Though it singles out agricultural advancement of Punjab, it does not provide a sort of out off point for other states. If we look at Table 2, giving classification of different sectors in terms of Chenery-Watanbe approach, for Gujarat-1969, there is no sector which qualifies as manufacturing intermediate having more than 45 both for use of inputs from other sectors (i.e. U_j) and being used as inputs for other sectors (i.e. W_i) and for Haryana, it is only chemical and Petroleum products for Maharashtra, it includes Paper, Fertilizers, Chemicals, Petroleum Products, Cement, Non-metallic mineral products. Basic Iron and Steel, Iron and Steel and Non-ferrous metral, for Rajasthan, Non-metallic mineral products, Basic metal industries, Metal products, Machinery and Rail road equipments, for U.P., Iron and Steel, Non-ferrous metral, Phosphatic fertilisers, Insecticides and Pesticides, Miscellaneous chemicals and for West Bengal, Chemical Products, Non-ferrous metal products, and Iron and Steel Products. There are quite a few consumption goods sectors falling in this category. On the other hand, if we look at the sectors falling in the category of primary food products, they include such sectors like coal in the case of Bihar, Drugs and Pharmaceuticals, Machinery, Electrical Equipment and Transport Equipment in the case of Gujarat, 1964-65 (24 sectors), Equipment in the case of Gujarat (1969-70), Metal Products, Machineries (sector No. 25, 26), Rail road and Transport equipments, Motor cycles and Bicycles, in the case of Haryana, Iron ore, Crude Oil, Petroleum products and Machinery in the case of Maharashtra, other chemicals, metal products and machineries (sector nos. 27, 28), Rail road

Transport equipments, Motor Cycles and Bicycles, Scientific and Surgical equipments in the case of Punjab, Fertilisers in the case of Rajasthan, Non-metallic mineral products, Potassic fertilisers, coal and coke and petroleum products in the case of U.P. Agriculture, Animal husbandry and Textiles invariably fall in this category. But the fact that Machineries in the case of Gujarat, Haryana, Maharashtra and Punjab belong to the category of Primary final products and quite a few consumption goods like Art Silk and Man made fibres, in the case of Gujarat (1964-65), Sugar confectionary, cotton ginning, pressing and other textiles in the case of Punjab, fall in the category of Manufacturing Intermediates reveal that inspite of Technological developments in quite a few states, the degree of variations is not very marked. The importance of foreign trade is also revealed by the use of the products of some sectors and inputs for some sectors being more than 100%. But this is true in the case of almost all the states. However, but for other chemicals, other non-metallic mineral products and metal products and non-electrical machinery for Bihar, chemical and petroleum products and Basic metal industries in the case of Haryana, fertilisers, cement, non-metallic mineral products, Basic Iron and Steel, Iron and Steel, Non-ferrous metal products, Basic chemicals and fertilisers and Basic Metal Products in the case of Punjab, Industrial chemicals, non-metallic and metallic industries and machinery in the case of Rajasthan, Iron and Steel, Cement, Phosphatic fertilisers, Insecticides and pesticides and miscellaneous chemicals in the case of U.P., there are many others which are in the category of consumption goods. Only fertilisers and Basic Iron and Steel in Maharashtra, use more inputs than their respective outputs. This is something, which requires further probing. However, the fact that it is not only manufacturing sectors but also consumption goods

products in the case of Bihar, Wood and Cork in the case of Gujarat (1964 (24 sectors), Cotton in the case of Haryana, Paper products and Plastic and Rubbers in the case of Rajasthan, Cotton, Tobacco and Rubber products in the case of U.P. figure in as being used as inputs in higher proportion than their total outputs obscure any clear cut demarcations of regional variations in the structure of development of different regions in India.

Thus to conclude as none of the regions ^{is} in the category of advanced industrial region they fall in the same category as far as their levels of development are concerned. Thus to conclude, as none of the regions is in the category of advanced industrial state, all of them fall in the mixed group. This confirms Leontief's and other studies that advanced states and less developed states have distinct structure of development.

REFERENCES

1. Structural Analysis of Gujarat, Punjab and Haryana Economics - An input - output study - Y.K. Alagh, G.S. Bhalla and S.P. Kashyap - Allied Publishers Pvt. Ltd. 1980
2. 'A Consistent forecasting Model of Gujarat's Economy: Y.K. Alagh, S.P. Kashyap and R.H. Desai - Anvesak - Dec. 1972.
3. Inter - Industry Input coefficient table for Assam - An approximation (1969) - S.N. Baruah - North Eastern Economics Review - Vol. I No. I 1977.
4. A note on Input - output system of Rajasthan's Industrial Economy, 1964 - G.S. Bohra and S.S. Mehta - Anvesak - Dec. 1971
5. International Comparisons of the structure of production - H.B. Chenry and T. Watanbe - Econometrica - Oct. 1958.
6. West Bengal and Metropolitan Calcutta: Input - Output tables.
7. Projections 1958 - 71 R.D. Dhar 'Structural interdependence of the soviet economy before the industrialisation drive' - E.G. Dolan - Soviet Studies - Jan 1967.
8. The structure of the 1966 Input - Output Tables of the Soviet Union in Basic Matrix Forms' - J.W. Gillula - Reference in studies in Soviet Input -Output Analysis - (Ad) by V.G. Treml - Preeger Publishers 1977.
9. Industrial Interdependence and Production Planning - J.W. Gillula - Chapter 2 of the studies in Soviet Input output Analysis Ibid.
10. Intersectoral Transaction in Producers Prizes in the Bihar Economy 1969 - 71 - p.p. Ghosh - Journal of Social and Economic Studies- Sept. 1976.
11. The Hierarchical structure of Interindustrial Transactions - Ernst Holmstadter - Included in international Comparisons of inter industry data - industrial Planning and Programming series No.2 United Nations Industrial Development Organisations 1969.
12. A study of the production structure of the Indian Economy An International Comparisons - K.V. Santhanam and R.H. Patil Econometrica, 1972.
13. The Fundamental structure of Input - Output Table, An International Comparison - D. Simpson and J. & Tsukui - Review of Economics and Statistics Nov. 1965.
14. Regional Input - Output Matrix, India 1965 - P. Venkatramiah A.R. Kulkarni and L. Argada - Artha Vijyanana, Sept. - December 1979.
15. An Experimental Dynamic Model of the U.S. Economy - Marshall Wood and H. Burka - American Statistical Association Dec. 1950. Reference in International Comparisons of the structure of Production - 4 - B. Chery and Watanbe op. cit.
16. Introduction to Input - Output Economics - C.S. Yanholt Rinchart and Winsten 1968.
17. Economic Interrelatedness C.S. Yarn and E. Ames - Review of Economics Studies - Oct. 1965.

Classification of Manufacturing Sectors. Input-Output
Ratio for Uttar Pradesh 1970-71

(For 100 rupees of Output)

| Name of the Intermediate w _i > 45 | Name of the Final U < 45 |
|---|--------------------------------|
| Name of the Manufacturing U _j > 45 | |
| (6) Iron & Steel | (1) Construction |
| (7) Non-ferrous metal | (2) Ele. Equipment |
| (12) Woollen products | (4) Non-Ele. equip. |
| (18) Misc. food preparations | (5) Metal Products |
| (45) Phophatic fertilizers | (10) Leather & Leather Pdtcs. |
| (47) Rubber products | (14) Dairy Products |
| (50) Paints & varnishes | (15) Canning & preservation |
| (52) Insecticides & pesticides | (16) Grain Mill Products |
| (53) Drugs & Pharmaceuticals | (17) Tea & Coffee processing |
| (55) Misc. Chemicals | (19) Sugar |
| (62) Services | (20) Gur & Khandsari |
| (64) Others. | (21) Vanaspati |
| | (22) Oils |
| | (41) Woollen Textiles |
| | (42) Silk industry |
| | (54) Soaps & Glycerine |
| Name of the Primary U _j < 45 | |
| (3) Transport equipment | (11) Glass & Glass products |
| (8) Cement | (13) Non-metallic products |
| (9) Mining | (23) Beverage industries |
| (28) By products of Agri. | (24) Cigar & Cigarettes |
| (29) Oil seeds | (25) Other Tobacco manu. |
| (30) Sugarcane | (26) Cereals |
| (31) Cotton | (27) Pulses |
| (32) Tobacco | (32) Potato |
| (35) Other agri.products | (33) Fibres |
| (38) Fisheries | (36) Fruits, Veg. & Spices |
| (29) Forestry | (37) Animal husbandry |
| (44) Nitrogenous fertilizers | (40) Cotton Textiles |
| (48) Paper & Paper products | (43) Other textiles |
| (56) Power | (46) Potassic fertilisers |
| (58) Water Supply | (49) Printing & Publ. |
| (59) Railway transport | (51) Synthetic Rubber |
| | (57) Coal & Coke |
| | (60) Motor and other transport |
| | (61) Trade & Commerce |
| | (63) Petroleum Products. |

Classification of Manufacturing Sectors - Structure of Punjab
Economy ; Inter Industry flows 1969 - 70.

Name of the
manufacturing
 $U_j > 45$

Name of the Intermediate
 $W_i > 45$

13. Sugar & Confectionary
17. Cotton ginning pressing
and other textiles.

Name of the Final W $i < 45$

11. Dairy Products
12. Grain Mill Products
14. Edible Oil & other food
food Products
18. Saw mills & wooden container
19. Furniture & Fixtures.

Name of the
Primary
 $U_j < 45$

7. Oil seeds
9. Other Agri. & Forestry
products
21. Rubber & Leather prods.
24. Glass & Mineral
25. Basic Metal Industries
36. Electricity

1. Wheat
2. Rice
3. Maize
4. Cotton
5. Sugarcane
6. Grain & Pulses
8. Bajra
10. Animal Husbandry
15. Breweries & Beverages
16. Textiles
20. Printing and Publishing
23. Other Chemicals
26. Metal Products
27. Machinery except electrical
28. Electrical machinery
29. Rail Road equipment
30. Transport equipment
31. Repair of Transport Equipment
32. Motor cycles & Bicycles
33. Scientific & Surgical Instr.
34. Miscellaneous Industries
35. Construction.

Classification of Manufacturing Sectors. Structure
of Haryana Economy: Inter-Industry Flows and Pattern
of Final Demand 1969-70.

| Name of the Intermediate $w_i > 45$ | Name of the Final $w_i < 45$ | |
|---|---|---|
| Name of the Manufacturing $O_j > 45$ | (21) Chemical Petroleum products. (10) Animal Husbandry (11) Dairy Products (12) Grain Mill Products (13) Sugar & Confectionary (14) Edible Oil & Other foods. (16) Cotton ginning, pressing, other textiles. (17) Furniture & Fixtures (30) Surgical & Scientific Instruments. | |
| Name of the primary $O_j < 45$ | (5) Cotton (6) Gram & Pulses (7) Oil seeds (8) Other Agri. & forestry (18) Paper & Paper products (22) Glass & Mineral products (23) Basic Metal Industries (32) Electricity and water supply. | (1) Wheat (2) Rice (3) Bajra (4) Sugarcane (9) Construction (15) Textiles (19) Printing & Publishing (20) Rubber & Leather Prds. (24) Metal Products. (25) Machinery except electrical (26) Electrical machinery (27) Rail, Road Equipments (28) Transport Equipments (29) Motor Cycles/Bicycles (31) Miscellaneous Industries. |

Classification of Manufacturing Sectors - Inter - Industry
transactions, West Bengal 1958 (in millions of Rupees)

| Name of the Manufacturing Sector | Name of the Intermediate Sector | Name of the Final Sector |
|----------------------------------|---------------------------------|------------------------------|
| $U_j > 45$ | $w_i > 45$ | |
| | 8. Other Textiles | 4. Food Processing |
| | 9. Chemical Products | 7. Jute Textiles |
| | 10. Non-ferrous metal Products | 12. Engineering |
| | 11. Iron and Steel Products | 13. Construction |
| | 16. Misc. Industries | 15. Product & small establi. |
| $U_j < 45$ | | |
| | 1. Agriculture | 3. Other Minerals |
| | 2. Coal & Coke | 6. Cement |
| | 5. Sugar | 17. Tertiary & Transport |
| | 14. Electricity, | |

Classification of Manufacturing Sectors. Inter - Sectoral
 Transactions in the Maharashtra Economy 1963 at Purchase Prices

| Name of the Manufacturing | <u>w_i > 45</u> | Name of the Intermediate | <u>w_i > 45</u> | Name of the final w _i < 45 |
|---------------------------|------------------------------|-----------------------------------|------------------------------|---------------------------------------|
| | | 12. Paper | | 5. Food Industries |
| | | 16. Fertilizers | | 7. Tobacco Manufacturers |
| | | 17. Chemicals | | 9. Apparal |
| | | 19. Cement | | 10. Wood Products |
| | | 20. Non-metallic mineral Products | | 14. Leather Products |
| | | 21. Basic Iron & steel | | 24. Metal Products |
| | | 23. Non-ferrous metal | | 25. Non-electrical Machinery |
| | | | | 27. Transport Equipment |
| | | | | 28. Miscellaneous Manufacturing |
| | | | | 30. Construction |
| Name of the Primary | <u>w_j < 45</u> | | | 1. Agriculture |
| | | 2. Coal Etc. | | 3. Iron & etc. |
| | | 29. Electricity | | 4. Crude oil |
| | | 31. Railway Transport | | 6. Beverages |
| | | 32. Road Transport. | | 8. Textiles |
| | | | | 11. Furniture & Fixtures |
| | | | | 13. Printing |
| | | | | 15. Rubber Products |
| | | | | 18. Petroleum Products |
| | | | | 26. Electrical Machinery |

Classification of Manufacturing Sectors. Input-Output
Coefficient Matrix for Rajasthan

| Name of the Intermediate $w_i > 45$ | Name of the Final $w_i \leq 45$ |
|---|------------------------------------|
| Name of the Manufacturing $U_j > 45$ | |
| (9) Animal Husbandry | (11) Metal, Minerals |
| (16) Sugar & Gur | (13) Grain Mill Products |
| (22) Misc. Text. Prod. | (15) Tobacco manu. |
| (27) Plastic & Rubber | (17) Edible Oil |
| (33) Non-metallic Min. Prod. | (19) Food products |
| (34) Basic metal Indu. | (20) Cotton textiles |
| (35) Metal products | (21) Other textiles |
| (36) Machinery | (26) Leather products |
| (38) Rail Road equip. | (30) Misc. Chemicals |
| (46) Water | (37) Electric machinery |
| | (41) Scientific instrument |
| | (43) Misc. Indus. Nec. |
| | (44) Construction. |
| Name of the Primary $U_j \leq 45$ | |
| (8) Other agri. crops | (1) Bajra |
| (10) Forest | (2) Pulses |
| (14) Wine etc. | (3) Wheat |
| (23) Wood products | (4) Gram |
| (24) Paper products | (5) Other foodgrains |
| (29) Industrial chem. | (6) Cotton |
| (39) Transport equip. | (7) Oil seeds |
| (40) Motor cycle etc. | (12) Non-metallic Min. |
| (42) Jewellery etc. | (18) Salt. |
| (45) Electric Generation | (25) Printing & Pub. |
| (48) Road transport. | (28) Fertilizer |
| | (31) Glass |
| | (32) Cement |
| | (47) Railway Transport |
| | (49) Services. |

Classification of Manufacturing Sectors Inter-Sectoral
 Transactions in Producers Prices for Bihar 1969-70
 (Value in Rs. '000)

| Name of the Manufacturing $U_j > 45$ | Name of the Intermediate $w_i > 45$ | Name of the Final $w_i \leq 45$ |
|---|--|------------------------------------|
| | (9) Misc. Food Products | (7) Grain Mill Products |
| | (10) Textiles | (8) Sugar |
| | (12) Wood and cork | (11) Tanning & Footwear |
| | (14) Paper and Paper products | (13) Furniture & Fixtures |
| | (16) Basic Chemicals | (21) Glass & Glass Products |
| | (17) Other Chemicals | (22) Pottery |
| | (18) Petroleum Ref. | (23) Cement |
| | (19) M. Pf. of Ptr. & coal | (24) Mica |
| | (20) Str. clay prods | (26) Iron & Steel |
| | (25) Other Non-metallic Mineral Products | (31) Transport Equipment |
| | (27) M. Fer. Bas. Metals | (33) SS Manufacturing |
| | (28) Metal Products | (35) Construction |
| | (29) NE Machinery | (37) Other Transport |
| | (30) Electric Machinery | |
| Name of the Primary $U_j > 45$ | (3) Forestry | (1) Agriculture |
| | (5) Iron Ore | (2) Animal Hus. & Fishing |
| | (6) Other Mining | (4) Coal |
| | (32) Other Manufacturing | (15) Printing & Publishing |
| | (34) Electricity | (36) Railway Transport |
| | | (38) Trade Margin. |

Classification of manufacturing sectors.

Structure of Gujarat Economy : Inter Industry Flows, 1964-65.

| Name of the Manufacturing Uj > 45 | Name of the Intermediate wi > 45 | Name of the Final wi < 45 |
|-----------------------------------|--|--|
| | (10) Art Silk & Man-made fibres. | (4) Milk & Malted food |
| | (22) Wood & Cork | (5) Flour Mills & Starch |
| | | (7) Oil Industry |
| | | (9) Textiles |
| Name of the primary Uj < 45 | (2) Mining (11) Chemicals (12) Dye-Stuffs (14) Cement & Cement products (15) Non-metallic minerals (16) Paper & paper products (17) Basic metals & products (24) Electrical Light & power | (1) Agriculture & allied activities (3) Construction (6) Other food & Agro-based (8) Salt (13) Drugs & Pharmaceuticals (18) Machinery (19) Electrical Equipment (20) Transport Equipment (21) Leather & Rubber (23) Misc. Manufacturing |

Classification of Manufacturing Sectors. Inter-
 Industrial Flows of the Registered, Unregistered
 industrial and non-industrial sectors -1969-70
 Producers' Price (Gujarat Economy)

| Name of the Intermediate $w_i > 45$ | Name of the Final $w_i \leq 45$ |
|---|------------------------------------|
| Name of the Manufacturing $U_j > 45$ | (2) Milk food & malted food |
| | (3) Grain & Oil milling |
| | (4) Other food & agro-based. |
| | (6) Textiles |
| Name of the Primary $U_j \leq 45$ | |
| (7) Chemicals | (1) Agri. & Allied |
| (8) Non-metallic mineral products | (5) Salt |
| (9) Basic metal & metal products | (10) Equipment |
| (11) Wood, Paper, Leather and Rubber | (12) Misc. Products |
| (15) Electricity & Power. | (13) Mining |
| | (14) Construction. |

INTER-REGIONAL DISPARITIES IN LEVELS OF DEVELOPMENT

INDIAN EXPERIENCE)

R. T. Tewari

The problem of regional disparities in levels of development is not of the recent origin. Even during the first quarter of 19th century there were many countries like United States, Canada, United Kingdom, France, Netherlands and Sweden, which experienced its severity to a considerable extent.¹ Today, the problem of regional disparities has become most crucial in almost all the countries of the world - whether developed or developing - although the degree of its proneness is more acute and explosive in the latter. In developed countries, regional disparities generally showed divergence in the early phases of their development but during fifties the record was somewhat mixed; some of these countries had almost a stable coefficient of variation while others had the tendency towards convergence.² However, due to a drastic change in situation during sixties, the tendency towards convergence or depolarisation prevailed in almost all the developed countries simply because backward regions got an opportunity to consolidate their position.³ On the other hand, most of the developing countries, during the period of their planned development, experienced 'enclave type' development because of the larger concentration of modern sector activities in urban centres mainly metropolises, degenerating growth impulses to their peripheries.

Like other developing countries, India also suffers from the acute and more explosive problem of regional disparities. Our successive Five Year Plans have construed the complexity of this problem in various pronouncements made in the plan documents.⁵ But the efforts made through the first three plans were primarily oriented towards achieving the objective of higher growth rates. The scarcity of resources and efficiency of investment often made it imperative for the decision makers to concentrate developmental efforts at those parts of the economy and those regions of the country where rates of return were expected to be comparatively high. This type of implementation of planned development programmes resulted in widening of regional disparities in levels of development and strengthening of the dualistic structure of economy.⁶ Moreover, judging from the measures adopted and the results achieved there appears to have been only some vague quest for balance or equity till the end of the Third Plan. However, with the commencement of the Fourth Plan, planning for regional development, especially for backward areas, started receiving special attention.⁷ Besides higher allocations of central assistance to backward regions, numerous programmes based on 'Area Development' and 'Target Group' approaches were launched around seventy with a view to achieving the objective of reducing regional disparities.

In the above context, we also find that during the previous two decades quite a large number of studies have been accomplished by the academicians, researchers and planners in the field of regional disparities/inequalities both at the

global and the national levels. While carrying out inter-country analysis of regional disparities during the process of economic growth, authors have generally used per capita income as a single indicator of development. Hughes⁸ and Booth⁹ have found that regional disparities become larger and larger or diverge with economic growth, whereas Hanna¹⁰ has empirically shown that disparities converge in the process of economic growth. However, most widely prevalent view, according to the concentration-cycle hypothesis propounded by Hirschman,¹¹ Myrdal¹² and Alonso¹³ and empirically validated by Williamson¹⁴ and Koropeckyj,¹⁵ is that as an economy grows, regional disparities diverge at first only to converge later. Of these studies, Williamson's contribution is said to be an excellent piece of empirical work. Both cross-sectional and time series approaches are used, and both methods confirm the tendencies of regional inequalities first to increase and later to decrease with the process of national development. The use of per capita income as a single indicator of development has, however, narrowed down the scope of analysis to a considerable extent. This is mainly because development is a web of several socio-economic activities, which cannot be comprehended by observing only one indicator, i.e., per capita income.¹⁶

As indicated above in India too, since the dawn of seventies there has been continuous improvements both in quality as well as quantity in regional studies in academic institutions, research organisations and state planning departments. The focus has, however, varied significantly from study to study

ranging from inequalities at the state level to those of the district and the block levels. In most of the studies, states have been taken as the unit of regional analysis.¹⁷ Some studies have also been carried out considering districts as the unit of regional analysis.¹⁸ Although these studies have made use of more than one indicator, they appear to be mainly concerned with measuring the levels of development and that too at a particular point of time.¹⁹ Some of these studies have, however, used the cross-section data of the selected indicators for more than one point of time also.²⁰ But none of them analyses the impact of the present development strategies/policies on reducing regional disparities in levels of development. Thus, it appears that so far only a small amount of research effort has been devoted to comparative analysis of regional disparities as related to the process of development.

Objectives

The present paper, therefore, attempts to assess the inter-state disparities in levels of development in India at three points of time (i.e., 1960-61, 1968-69 and 1978-79) and analyse the impact of the existing development strategies/policies on reducing regional disparities during seventies as compared to sixties. We have also attempted to shed light on the measures, which could be enforced in future for a progressive reduction in regional disparities, besides testing the following hypotheses :

Hypotheses

1. Whether disparities in developing states tend to be higher in magnitude than those of the developed states;
2. Is it true that larger the geographical size, larger would be the magnitude of regional disparities and vice-versa;
3. Whether regional disparities tend to diverge in the early stages of development and show a tendency towards convergence in the mature stages. Will these disparities trace out a curve of an inverted 'U' shape over the long term development path; and
4. Whether changes in development strategies/policies have really helped in reducing inter-regional and intra-regional disparities in India during seventies as compared to sixties.

Methodology

In order to make the results comparable at the selected points of time, only 15 states of the country could be considered for the purposes of present analysis mainly because of non-availability of data for rest of the states/union territories. The data compiled from secondary sources mainly consist of various issues of Statistical Abstract and Census, Government of India and relevant publications of Planning Department, Government of Uttar Pradesh.

Development is a multi-dimensional phenomenon. Economists, geographers, sociologists and regional scientists define it in different ways with varying stress on its aspects. In the present case, development is, however, defined in terms of composite index based on 19 indicators, each one having values varying from state to state all over India. The main sectors from where these indicators have been drawn concern with agriculture, industry, irrigation, power, roads, education and

health. All these indicators, which, by and large, exhibit the performance of various on-going socio-economic activities of the Indian economy, are given in table - 2.

The methods, commonly in vogue for measuring the level of development through construction of composite indices by pooling the selected indicators, are those of index, rank and principal component analysis.²¹ Of these, the index method has been used here for working out the composite index of development.

The coefficient of variation is taken to be an index of regional disparities in the present context. The disparities can be measured both in absolute and relative terms. But in the present case, these disparities have been measured in terms of relatives, not absolutes : the value of each of the selected indicators of development for different states is taken as a percentage of the average value of the corresponding indicator at the national level. A disparity measure of this sort implies a comparison of state level growth rates and is much more informative for our purposes than the absolute measure of disparity. Moreover, this also helps us in better summarising the degree of disparity by indicating that most of the states have values of a particular indicator less than the national average.²²

Regional disparities in levels of development have been measured, using the following formula of unweighted coefficient of variation (V_{uw}) :

$$V_{uw} = \sqrt{\frac{\sum_{i=1}^N (x_i - \bar{x})^2}{N}} , \text{ where } \bar{x}$$

N = Number of States

x_i = Value of Indicator of the i^{th} state

\bar{x} = Average value of indicator for the nation.

Theoretically, higher value of V_{uw} would indicate higher magnitude of regional disparities and vice versa.²³

State-wise Composite Index of Development

Following the criterion of ranking, all the 15 states considered here have been divided into two categories - 'developed' and 'developing'. The former consists of Punjab, Kerala, Tamil Nadu, Maharashtra, Gujarat, Haryana, Karnataka and West Bengal, which, according to the composite index of development, are found to be above the national average during each of the years, 1960-61, 1968-69 and 1978-79. Whereas, the latter includes the states of Himachal Pradesh, Orissa, Madhya Pradesh, Rajasthan, Bihar, Uttar Pradesh and Andhra Pradesh, which have composite index of development below the national average during these years :

Table 1 : Ranking of States by Composite Index of Development^{1/} (CID)

| Sl. No. | State | 1960-61 | | 1968-69 | | 1978-79 | |
|-----------------------------|--------|---------|--------|---------|--------|---------|------|
| | | CID | Rank | CID | Rank | CID | Rank |
| A. Developed States | | | | | | | |
| 1. Punjab | 122.93 | 2 | 141.03 | 3 | 156.82 | 1 | |
| 2. Kerala | 122.11 | 3 | 172.92 | 1 | 138.90 | 2 | |
| 3. Tamil Nadu | 121.48 | 4 | 148.05 | 2 | 136.45 | 3 | |
| 4. Maharashtra | 124.28 | 1 | 117.20 | 4 | 123.06 | 4 | |
| 5. Gujarat | 113.25 | 5 | 109.95 | 6 | 119.05 | 5 | |
| 6. Haryana | * | - | 100.75 | 7 | 116.40 | 6 | |
| 7. Karnataka | 110.33 | 6 | 111.54 | 5 | 113.68 | 7 | |
| 8. West Bengal | 100.15 | 7 | 100.65 | 8 | 108.88 | 8 | |
| B. Developing States | | | | | | | |
| 9. Andhra Pradesh | 88.72 | 9 | 95.94 | 9 | 98.01 | 9 | |
| 10. Himachal Pradesh | 85.15 | 10 | 84.98 | 11 | 98.00 | 10 | |
| 11. Uttar Pradesh | 78.46 | 14 | 84.41 | 12 | 86.63 | 11 | |
| 12. Orissa | 89.81 | 8 | 91.63 | 10 | 84.21 | 12 | |
| 13. Rajasthan | 81.57 | 13 | 74.81 | 15 | 81.00 | 13 | |
| 14. Bihar | 81.70 | 12 | 82.72 | 13 | 77.88 | 14 | |
| 15. Madhya Pradesh | 83.24 | 11 | 79.97 | 14 | 75.97 | 15 | |
| INDIA | 100.00 | - | 100.00 | - | 100.00 | - | |

1 Based on cross-section data of selected indicators described in table 2.

* In 1960-61, Haryana was not a separate state and was only a part of Punjab, therefore the progress of the former is included in the composite index of development of the latter.

An interesting finding is that although some slight variations in the order of ranking of states separately for either of the category are quite perceptible, the inter-state upward or downward movements in the levels of development between the two categories never occurred during any of the reference year.

Moreover, the absolute index values for some of the States have increased, reflecting a slight rise in their levels of overall development, but their relative positions have not registered any appreciable change. The grouping of states into 'developed' and 'developing' for 1978-79 is also found to be valid during 1960-61 and 1970-71 with some slight changes. The Spearman's coefficients of rank correlations for states between 1960-61 & 1970-71 and 1970-71 & 1978-79, which are estimated at 0.92 and 0.96 respectively, also confirm that during the period of previous two decades no significant change is effected in the ranking pattern of different states. Thus, it seems that the development during the period of planning has followed the initial inter-regional pattern. But some of the states seem to have gained benefits of previous planning and have accelerated their development to some extent. For example, the states of Andhra Pradesh and Himachal Pradesh, which still fall in the category of developing states, have made progress to the extent that they have become closer to the national average. A pertinent question now arises as to what extent the differences in levels of development between the developed and developing states can be explained by analysing the disaggregated form of the composite index in terms of the selected indicators. In our frame of indicators, we find that per capita state domestic product, percentage of urban population to total population, percentage of villages electrified to total number of villages and literacy percentage are directly associated with levels of development.

The values of all the above mentioned four indicators associated with levels of development in majority of the developed states are above the national average and are also significantly greater than the values of the corresponding indicators in developing states. The per capita state domestic product in developed states during 1978-79 ranged from the lowest (Rs.1116) in Tamil Nadu to the highest (Rs.2080) in Punjab, whereas the corresponding values in developing states were Rs.773 in Bihar and Rs.1295 in Himachal Pradesh against the national average of Rs.1267. In case of urbanisation, all the developed states excepting Kerala and Haryana are above the national average (23.73%), whereas the corresponding percentages for all the developing states are found to be

lower than the national average, ranging from 7.72 per cent in Himachal Pradesh to 23.25 per cent in Andhra Pradesh. So far as rural electrification is concerned, all the developed states except West Bengal (33.78%) are above the national average (43.44%) in terms of percentage of villages electrified to total number of villages, whereas the corresponding percentages in case of developing states are found to be lower than the national average with exceptions of two states, Andhra Pradesh (60.49) and Himachal Pradesh (52.72). Lastly, the literacy percentages according to 1981 Census in developed states lie between 35.84 in Haryana and 69.17 in Kerala against the national average of 36.17. But the corresponding percentages in case of developing states are found to be much lower in comparison to developed states as well as the national average.

On the other hand, the indicators, which have been identified as causal factors, consist of consumption of fertiliser per ha. in agriculture, per capita consumption of electricity, length of roads per 00 sq. km. of area, credit-deposit ratio, per capita market borrowing and per capita plan outlay. Within the developed states, consumption of fertilizer per ha. in agriculture is found to be the lowest (21.23 kg.) in Maharashtra and the highest (106.80 kg.) in Punjab, however all these states excepting Maharashtra do have these figures above the national average (30.50 kg.). The corresponding figures in developing states are found to be 8.50 kg. in Orissa and 43.30 kg. in Uttar Pradesh, but all the developing states excepting Andhra Pradesh and Uttar Pradesh are making use of fertilizer much

below the national average. Similarly, per capita consumption of electricity is much higher (between 99.11 kwh and 314.06 kwh) in developed states as compared to (between 56.61 kwh and 109.71 kwh) developing states against the national average of 130.48 kwh.

Moreover, almost all the developed states except Gujarat have length of roads per 00 sq. km. of area above the national average of 46.79 kms, but the corresponding figures in case of all the developing states except Uttar Pradesh and Orissa are far below the national average. The credit-deposit ratios in developed states are generally higher than those of the developing states. These ratios in case of the former lie between 54.60 (Gujarat) and 84.90 (Tamil Nadu), whereas the corresponding ratios in developing states are found to be 29.00 (Himachal Pradesh) and 73.20 (Andhra Pradesh) against the national level ratio of 68.30. Thus, it seems that none of the states - whether developed or developing - are making fuller utilisation of their deposits for further investment by transforming them into credit. Similarly, per capita market borrowing in all the developed states is much higher than those of the developing states. Within the developed states, per capita borrowing ranges from Rs.63 in Maharashtra to Rs.108 in Haryana, whereas the corresponding borrowings in developing states are found to be Rs.34 in Bihar and Rs.75 in Rajasthan respectively as against the national average of Rs.55. This is indicative of the fact that developed states possess higher capabilities of resource utilisation than the developing states.

Finally, in spite of laying much emphasis on making proportionately higher allocations of financial resources to developing states, we observe that majority of the developed states were provided with larger share in terms of per capita plan outlay during the period 1951-79. Within the developed states, allocations of per capita plan outlay during 1951-79 ranged from Rs.586 in West Bengal to Rs.1671 in Haryana, whereas the corresponding outlays in developing states varied from Rs.479 in Bihar to Rs.696 in Orissa as against the national average of Rs.734.

The foregoing analysis of explanatory variables provides us at least some indications to conclude that higher values of the selected indicators in developed states have proved to be effective in stimulating the process of development, whereas lower order of these values in developing states have resulted in a slower pace of development.

Regional Disparities in Levels of Development

In the initial stages of national development, our measure of regional disparities, V_{uw} computed with the help of the composite indices of development (based on 19 indicators) was as low as 16.70 in 1960-61. But during the transitional phase of national development (1960-61 to 1968-69), these disparities showed divergence or spatial polarisation and appreciably increased to the level of 24.10 during 1968-69. This conforms with the findings of an empirical study highlighting that in India the magnitude of inter-state disparities in levels of per capita net domestic product, which was 19.59 in 1960-61, considerably increased to 26.85 during 1969-70.²⁴

Contrary to this, during seventies, we find that these disparities in India reduced to some extent as would be evident from the following table :

Table 2 : Coefficient of Variation in Levels of Development of Different States in Respect of Selected Indicators

| Sl. No. | Indicators | Coefficient of variation during (Percentage) | | |
|--|---|---|---------|---------|
| | | 1960-61 | 1968-69 | 1978-79 |
| 1. | Per capita state domestic product at current prices | 19.63 | 22.80 | 27.58 |
| 2. | Share of secondary sector in state domestic product | 27.50 | 29.29 | 25.79 |
| 3. | Share of tertiary sector in state domestic product | 15.35 | 16.48 | 17.24 |
| 4. | Proportion of urban population to the total population | 39.76 | 37.13 | 33.25 |
| 5. | Proportion of workers to total population | 15.68 | 11.85 | 17.41 |
| 6. | Cropping intensity | 11.56 | 12.84 | 13.26 |
| 7. | Proportion of commercial crops to gross cropped area | 51.78 | 54.62 | 59.59 |
| 8. | Irrigation coverage | 60.54 | 62.71 | 65.21 |
| 9. | Irrigation intensity | 15.32 | 14.06 | 14.04 |
| 10. | Consumption of fertilizer per ha. in agriculture | 67.42 | 70.45 | 71.94 |
| 11. | Value added by manufacture per industrial worker | 39.45 | 20.30 | 19.59 |
| 12. | Credit-deposit ratio | - | 49.16 | 24.39 |
| 13. | Per capita consumption of electricity | 61.29 | 49.19 | 48.08 |
| 14. | Proportion of villages electrified to total villages | 57.75 | 88.71 | 43.54 |
| 15. | Length of roads per 00 sq. km. of area | 54.03 | 106.84 | 75.18 |
| 16. | Junior basic schools per lakh of population | 25.19 | 27.78 | 35.03 |
| 17. | Literacy percentage | 31.99 | 31.83 | 28.06 |
| 18. | Number of allopathic hospitals/ dispensaries per lakh of population | 45.76 | 42.43 | 43.60 |
| 19. | Number of hospital beds per lakh of population | 41.29 | 36.87 | 42.73 |
| Aggregate (based on composite index of 19 selected indicators) | | 16.70 | 24.10 | 21.33 |

Based on cross-section data of 19 selected indicators.

As shown above, the coefficients of variation in levels of development of different states in respects of per capita state domestic product at current prices, irrigation coverage, consumption of fertilisers per ha. in agriculture, percentage of villages electrified to total villages and length of roads per 00 sq. km. of area, which were 19.63, 60.54, 67.42, 57.75 and 54.03 in 1960-61, increased to the levels of 22.80, 62.71, 70.45, 88.71 and 106.84 respectively during 1968-69. These sectoral disparities have, inter alia, contributed favourably to the over all inter-state disparities which showed a considerable increase from 16.70 in 1960-61 to 24.10 during 1968-69.

On the other hand, during seventies as a result of changes in development strategies/policies a variety of programmes based on 'Area Development' and 'Target Group' approaches were launched with a view to not only providing income and employment opportunities to the people of backward areas but also arresting the widening of inter-regional disparities. Important among these programmes were Drought Prone Area Development Programme (DPAP), Small Farmers Development Agency (SFDA), Marginal Farmers and Agricultural Labourers (MFAL), Command Area Development (CAD), Tribal Area Development (TAD), industrialisation of backward areas, Minimum Needs Programme (MNP), Integrated Area Development Programme (IADP) and Integrated Rural Development (IRD), besides higher allocation of financial resources to backward states. A huge amount of investment was made on implementation of these programmes during the period of the Fourth and Fifth Plans. Moreover, an outlay earmarked for implementation of these programmes during the Sixth Plan is approximately Rs.7700 crores, which comes to about 8 per cent of the total public sector outlay.²⁵

It is difficult to assess, in isolation, the impact of above area specific programmes on development, but temporal analysis of growth rates and regional disparities, if attempted, is expected to provide some indications about its favourable or unfavourable influence on the levels of development and regional disparities.

It would be evident from the following table that the annual growth rate of per capita income at constant prices of 1960-61, which was 0.892 per cent in India during sixties (i.e. 1960-70), significantly increased to 1.752 per cent during seventies (i.e. 1972-80) at constant prices of 1970-71.

Table 3 : State-wise annual growth rate of per capita income

| Sl. No. | States | Annual growth rate of per capita income during | |
|-----------------------------|--------|--|--------------------------------|
| | | 1960-70 (at 1960-61 prices) | 1972-80 (at 1970-71 prices) |
| <u>A. Developed States</u> | | | |
| 1. Punjab | | 2.730 | 2.846 |
| 2. Kerala | | 0.781 | 0.988 |
| 3. Tamil Nadu | | -0.445 | 1.431 |
| 4. Maharashtra | | -0.128 | 5.718 |
| 5. Gujarat | | 1.266 | 5.475 |
| 6. Haryana | | * | 2.349 |
| 7. Karnataka | | 1.645 | 2.633 |
| 8. West Bengal | | 0.771 | 1.378 |
| <u>B. Developing States</u> | | | |
| 9. Andhra Pradesh | | 0.885 | 3.758 |
| 10. Himachal Pradesh | | * | 1.400 |
| 11. Uttar Pradesh | | -0.432 | 0.380 |
| 12. Orissa | | 2.860 | 0.469 |
| 13. Rajasthan | | -1.052 | 3.529 |
| 14. Bihar | | -0.350 | 1.123 |
| 15. Madhya Pradesh | | -0.215 | -0.491 |
| INDIA | | 0.892 | 1.752 |

* Owing to non-availability of data, the annual growth rates of per capita income of Haryana and Himachal Pradesh could not be worked out during the period 1960-70.

It is also observed that the annual growth rate of per capita income in all the developed and developing states excepting Orissa and Madhya Pradesh moved towards higher side in seventies as compared to sixties. Moreover, the states of Uttar Pradesh, Rajasthan and Bihar, which had negative growth rates of per capita income in 1960-70, turned out to have positive growth rates during seventies.

Turning to the aspect of regional disparities, we find that coefficients of variation in levels of development for 15 states in respect of percentage share of secondary sector in the state domestic product, percentage of urban population to total population, credit-deposit ratio, percentage of villages electrified to total number of villages and length of roads per 00 sq. km. of area have significantly reduced from 29.29, 37.13, 49.16, 88.71 and 106.84 in 1968-69 to 25.79, 33.25, 24.39, 43.54 and 75.18 respectively during 1978-79. Comparatively lower levels of coefficient of variation in respect of these indicators appear to have finally helped in reducing over-all inter-state disparities from 24.10 in 1968-69 to 21.33 during 1978-79.

It is difficult to trace out any definite trend in the existing regional disparities on the basis of its study confining to the above three selected points of time. However, through diagrammatic presentation, if all the three points showing different magnitudes of disparities are linked together with dotted line for all the three selected points of time, the curve would provide some indications to believe that time series analysis of regional disparities would trace out an inverted 'U' shape during the process of long term national development.

A theme of the preceding analysis reveals that both the overall and sectoral growth rates have shown an upward movement in India during seventies as compared to sixties. On the other hand, inter-state disparities have gone down during the latter decade. Hence, it appears that implementation of various area specific programmes based on the revised development strategies/policies have largely been in favour of not only enhancing the growth rates but also reducing the inter-state disparities.

Level of Development and Regional Disparities

While attempting to analyse the relationship between state-wise levels of development and inter-regional disparities we observe through the following table that our measure of inter-state disparities, V_{uw} ranges widely between a minimum of 26.36 for Punjab and a maximum of 65.81 for Madhya Pradesh during 1978-79. Contrary to it, in the matter of overall development the former occupies the first position with composite index of 156.82 and the latter finds its place at the bottom with composite index of 75.97 only. Thus, the state of Punjab with the highest level of development has the lowest magnitude of regional disparities and the vice versa is true in case of Madhya Pradesh.

Table 4 : State-wise level of development and coefficient of variation - 1978-79

| Sl. No. States according to level of development ^{1/} | Composite index of development ^{2/} | Coefficient of variation ^{3/} |
|--|--|--|
| A. Developed States | | |
| 1. Punjab | 156.82 | 26.36 |
| 2. Kerala | 138.90 | 26.83 |
| 3. Tamil Nadu | 136.45 | 45.65 |
| 4. Maharashtra | 123.06 | 41.79 |
| 5. Gujarat | 119.05 | 46.22 |
| 6. Haryana | 116.40 | 35.96 |
| 7. Karnataka | 113.68 | 49.62 |
| 8. West Bengal | 108.88 | 49.84 |
| B. Developing States | | |
| 9. Andhra Pradesh | 98.01 | 57.49 |
| 10. Himachal Pradesh | 98.00 | 52.14 |
| 11. Uttar Pradesh | 86.63 | 55.68 |
| 12. Orissa | 84.21 | 47.91 |
| 13. Rajasthan | 81.00 | 61.54 |
| 14. Bihar | 77.00 | 59.98 |
| 15. Madhya Pradesh | 75.97 | 65.81 |

1 States having composite index of '100 and above' are designated as 'developed states' and those falling in the category of 'developing states' have composite index 'below 100'.

2 Based on the cross-section data of 1978-79 for the 19 selected indicators.

3 Based on the district-wise composite index of development of different states for 1980-81 as worked out with the help of 9 selected indicators placed at Appendix - 1.

It is also clear from the above table that by and large the states, which fall in the category of developed stages, have comparatively lower order of inter-regional disparities, whereas those falling in the category of developing states have relatively higher order of these disparities. The degree of regional disparities goes on increasing gradually as we move from higher level of composite index of development to its lower side. In spite of few exceptions it does appear from the coefficient of correlation (-0.88) between the composite index of development and the coefficient of variation that the former is inversely related to the latter. Thus, the pattern of regional disparities that emerges from the present analysis is not consistent with that of the other cross-section study showing its different pattern in the form of an inverted 'U', reaching a peak in the states of medium levels of development.²⁶

Geographic Size and Regional Disparities

The geographic size also influences the degree of regional disparities. Hypothetically, larger the geographic size of a state, the greater would be the degree of regional disparities. It seems to be convincing also because larger geographic size is likely to result in wide regional variations in the availability of natural resource endowments, weaker intra-state linkages and stronger incidence of dualism. In the present case, the comparison between the geographic size of different states and the corresponding magnitude of regional disparities suggests that the above hypothesis holds good in case of 11 out of the total 15 states. Furthermore, among the states,

we identify Madhya Pradesh having the highest geographical area (443 thousand sq. km.) with the highest magnitude of regional disparities (i.e. 65.81), whereas in case of Punjab which stands lowest in area (50 thousand sq. km.) only after Haryana and Kerala, the regional disparities are the lowest (26.36). The coefficient of correlation between the geographic size and coefficient of variation for different states, which works out to be as much as 0.72, also corroborates the hypothesis.

However, the states of Maharashtra, Gujarat, Karnataka and Himachal Pradesh are found to be disfavouring the above hypothesis. The first three states, although own larger geographical area but have regional disparities comparatively of lower order. A plausible reason being that these states introduced decentralised planning during the period of the Fifth Plan to overcome delay in decision making and devise measures for better exploitation of natural and manpower resources available at the micro-level. Following the broad principles of decentralised planning, the exercises relating to the delegation of powers and disaggregation of various functions of planning and implementation at different levels were carried out in these states. And the various programmes/schemes based on this principle were implemented. From the experiences of these states, it seems that decentralised planning has proved to be an effective tool in promoting exploitation of local resources, accelerating the pace of development in backward pockets and reducing intra-state disparities significantly. Considering the advantages of this approach, the state of Uttar Pradesh has also adopted

the decentralised planning during the recent past. In case of Himachal Pradesh, the position is just reverse to Maharashtra, Gujarat and Karnataka; the geographical area is comparatively low (56 thousand sq. km.) but the magnitude of regional disparities is considerably high (52.4). In fact, Himachal Pradesh prior to its declaration as a new state, was one of the most backward union territory of our country. It was carved out as a new state only in 1971 with merger of three districts of Punjab (Kullu, Kangra and Simla) having a vast potential of agricultural development. Subsequently, a sizeable amount of investment was made in these districts mainly for the development of socio-economic infrastructure. With the result, there has been a larger concentration of economic activities, making this area relatively more prosperous than the old Himachal Pradesh. This may be one of the reasons that although the state is smaller in a geographical area, it suffers from the problem of high magnitude of regional disparities.

Intra-State Disparities

So far as intra-state disparities are concerned, all our efforts were made in different states particularly Uttar Pradesh around seventy to arrest its widening magnitude through implementation of various area specific programmes like Tribal Area Development (TAD), Hill Area Development (HAD), Drought Prone Area Development (DPAP), Small Farmers Development Agency (SFDA), Command Area Development (CAD), Integrated Area Development (IAD), Integrated Rural Development (IRD), besides industrialisation of backward areas. The coverage under these programmes is so wide that almost all the districts of Uttar Pradesh are being

benefited by one or the other such programmes. Although these programmes are characterised as 'piecemeal' and 'ad hoc', their implementation seems to have played an effective role in reducing intra-state disparities as would be evident from the following table.

Table 5 : Coefficient of variation in levels of development of different regions of U.P. in respect of the selected indicators

| Sl. No. | Indicators | Coefficient of variation* (Percentage) | |
|--------------------------------------|--|---|---------|
| | | 1968-69 | 1978-79 |
| 1. | Gross value of agricultural produce per ha. of net area sown | 21.53 | 27.52 |
| 2. | Intensity of cropping | 9.93 | 10.97 |
| 3. | Value of industrial produce per industrial worker | 18.43 | 18.34 |
| 4. | Proportion of workers engaged in secondary sector to total workers | 71.88 | 70.95 |
| 5. | Credit-deposit ratio | 39.46 | 17.78 |
| 6. | Length of metalled roads per 000 sq. km. of area | 17.64 | 13.14 |
| 7. | Proportion of villages electrified to total villages | 53.04 | 21.11 |
| 8. | Number of junior basic schools per 000 sq. km. of area | 28.88 | 26.89 |
| 9. | Number of hospitals/dispensaries per 000 sq. km. of area | 23.64 | 27.49 |
| 10. | Literacy percentage | 15.49 | 15.79 |
| 11. | Proportion of urban population to total population | 22.37 | 21.82 |
| Aggregate : based on composite index | | 19.64 | 17.06 |

* Based on cross-section data of 11 selected indicators

As shown above, the coefficient of variation in levels of development of different regions of the state, which was 19.64 in 1968-69, reduced to 17.06 during 1978-79. This may be because of the significant reduction in infrastructural gaps. The

coefficient of variation in respect of the length of metalled roads per 000 sq. km. of area for different regions decreased from 17.64 to 13.14 during the period 1968-79. Moreover, the corresponding coefficient of variation in respect of villages electrified to total number of villages also showed a considerable reduction from 53.04 to 21.11. This might have increased accessibility of the people to urban and market centres, ensuring their better participation in various developmental activities.

Apart from reducing intra-state disparities, implementation of various area specific programmes also seems to have influenced favourably the performance of the state economy during seventies. The growth rate of overall state income, which was 2.6 per cent over a longer period of 1960-79, appreciably increased to 4.0 per cent during the period 1972-79. Similarly, the growth rates of agriculture and animal husbandry, manufacturing and rest of the sectors increased respectively from 1.9, 4.2 and 3.3 to 4.2, 6.3 and 3.4 during the corresponding periods.²⁷

Thus, the foregoing analysis suggests that if a regional approach to planning within its multi-level framework is followed on scientific lines, the comprehensive regional planning would definitely prove to be an effective tool for achieving the objective of balanced regional development.

Conclusion

The analysis of state-wise composite index of development at three points of time suggests that although some slight variations in the order of ranking of states separately for

each of the categories, 'developed' and 'developing' states are quite perceptible, the inter-state upward or downward movements in levels of development between the two categories never occurred during any of the years under reference. Thus, it seems that the development during the period of planning has followed its initial inter-regional pattern to a large extent. However, almost all the states seem to have benefited with the previous planning and have also accelerated pace of their development to some extent.

A perpetual gap in levels of development between the 'developed' and 'developing' states is largely explained by the availability of higher order values of the selected indicators in the former as compared to the latter. Apart from low level of inputs use, inadequacy of existing infrastructural facilities still seems to be the major obstacle to the path of progress in developing states. Therefore, assigning top priority to development of infrastructure for enhancing capabilities of resource utilisation in these states obviously becomes sensible, besides ensuring proportionately higher allocations of per capita plan outlays.

Secondly, our temporal analysis suggests that in early stages of national development, particularly during 1960-69, inter-state disparities in levels of development have shown divergence or spatial polarisation, whereas the tendency of convergence or depolarisation was experienced to some extent during seventies. Moreover, according to cross-section approach, there seems to be a consistent relationship between levels of development and regional disparities. The regional disparities

during 1978-79 are found to be considerably high in developing states, but consistently go on reducing as we move to the states of higher levels of development.

Thirdly, the introduction of decentralised planning in three states of Maharashtra, Gujarat and Karnataka during the period of Fifth Five Year Plan seems to have played an effective role not only in promoting more and more use of local resources but also accelerating the pace of development particularly in lagging areas. Consequently, these states in spite of having relatively larger geographical area have regional disparities of lower magnitude. With this background, it would be desirable to introduce decentralised planning in rest of the states in order to achieve the objective of reducing regional disparities significantly.

Finally, although the various programmes based on 'Area Development' and 'Target Group' approaches launched around seventy, are characterised as 'piecemeal' and 'ad hoc', their implementation in Uttar Pradesh has brought about reduction in regional disparities to some extent, besides influencing favourably the overall performance of the state economy. Hence, it appears that if a regional approach to planning within its multi-level framework is followed on scientific lines, the comprehensive regional planning would definitely prove to be an effective tool for achieving the objective of balanced regional development.

APPENDIX 1

Indicators and Their Weights Used for Computing
the Composite Index of Development for Different
Districts

| Sl. No. | Indicator | Weights in per- centage for all the districts other than 9 dis- tricts indicated in the next column more | For 9 dis- tricts with urban popu- lation of 72 per cent or more |
|------------|--|---|---|
| | I. Agriculture | 50 | 0 |
| 1. | Per capita value of output of 18 major crops : Average of 1975-76 to 1979-80 | 25 | 0 |
| 2. | Per capita bank credit for agriculture : June 1980 | 25 | 0 |
| | II. Mining and Manufacturing | 20 | 35 |
| 3. | Number of mining and factory workers per lakh of populat- ion, 1974 | 8 | 14 |
| 4. | Number of household manufac- turing workers per lakh of population : 1981 | 4 | 7 |
| 5. | Per capita bank credit for manufacturing sector: June 1980 | 8 | 14 |
| | III. Service Sector | 30 | 65 |
| 6. | Per capita bank deposit : June 1980 | 10 | 25 |
| 7. | Per capita bank credit to services : June 1980 | 10 | 25 |
| 8. | Literacy percentage : 1981 | 5 | 10 |
| 9. | Percentage of urban population to total population : 1981 | 5 | 5 |
| | TOTAL | 100 | 100 |

Source : District-Level Data for Key Economic Indicators With
Over 60 Maps, May 1982, Centre for Monitoring Indian
Economy, Bombay.

Notes and References

1. Williamson, J.G., Regional Inequality and the Process of National Development : A Description of the Patterns, in Edited L. Needleman, Regional Analysis, 1968, Great Britain, pp.130-133.
2. Singh, A.K., Patterns of Regional Development : A Comparative Study, 1981, New Delhi, p.6.
3. Stuart Holland, The Regional Problem, pp.15-19.
4. Singh, A.K., op. cit., p.6.
5. Mathur, O.P., Backward Areas in Poor Countries, Problems and Prospectives of Development With Special Reference to India, Occasional Paper, Massachussets Institute of Technology, U.S.A., 1971.
6. Generally the dualistic structure of economy is characterised by a situation in which subsistence production and production for the market co-exist, old and new technologies are used side by side and new social classes have arisen alongside the traditional strata: See David Colman and Federick Nixson, Economics of Change in Less Developed Countries; 1980, Delhi, p.vi.
7. Prabhakar Rao, P. and Sundaram, K.V., Regional Imbalances in India - Some Policy Issues and Problems, Indian Journal of Regional Science, Vol.5, No.1, 1973, p.61.
8. Hughes, Refus, B., Inter-Regional Income Differences : Self Perpetuation, Southern Economic Journal, Vol.28, No.1, 1961, pp.41-45.
9. Booth, E.J.R., Inter-Regional Income Differences, Southern Economic Journal, Vol.31, No.1, 1964, pp.44-51.
10. Hanna, Frank A., State Income Differentials : 1919-1954, Duke University Press, 1959, Durham.
11. Hirschman, Albert, O., The Strategy of Economic Development, Yale University Press, 1961, New Haven.
12. Myrdal, Gunnar, Economic Theory and Underdeveloped Regions, 1958, Bombay.
13. Alonso, William, Urban and Regional Imbalances in Economic Development, Economic Development and Cultural Change, Vol.17, No.1, 1968, pp.1-14.
14. Williamson, J.G., Regional Inequality and the Process of National Development, Economic Development and Cultural Change, Vol.13, No.4, 1965, Part II.

15. Koropeckyj, I.S., Equalisation of Regional Development in Socialist Countries, Economic Development and Cultural Change, Vol.21, No.1, 1972, pp.68-86.
16. Amitabh Kundu, Measurement of Urban Process : A Study in Regionalisation, Bombay, 1980, pp.28-29.
17. Singh, A.K., States as Planning Regions, Indian Journal of Regional Science, Vol.4, No.1, 1972.
18. Mitra, A., Levels of Regional Development in India, Census of India, Vol.1, Part 1-A, 1961.
19. Pal, M.N., Regional Disparities in the Level of Development in India, Indian Journal of Regional Science, Vol.VII, No.1, 1975, Kharagpur, pp.35-52.
20. Amitabh Kundu and Moonis Raza, Indian Economy : The Regional Dimension, New Delhi, 1982.
21. Tewari, R.T., Opportunity Structure and Industrialisation of Backward Areas in U.P., Working Paper No.37, Giri Institute of Development Studies, Lucknow.
22. Williamson, J.G., in Edited L. Needleman, op. cit., p.
23. Alternatively, for measuring regional disparities one can also use a weighted coefficient of variation, which is considered to be relatively a more accurate and reliable measure. However, in the present case we have made choice of V_{uw} because almost similar trends in regional disparities were witnessed through application of both the methods in one of the empirical study. See J.G. Williamson in Edited L. Needleman, op. cit., p.112.
24. Mathur, O.P., The Problem of Inter-Regional Disparities : The Indian Background, Indian Journal of Regional Science, Vol.V, No.1, 1973, p.90.
25. Government of India, Planning Commission, Sixth Five Year Plan - 1980-85, New Delhi.
26. The Economic Survey of Europe, 1954, pp.136-71.
27. Government of Uttar Pradesh, Planning Department, Draft Sixth Five Year Plan - 1980-85, Review, Vol.1, p.4.

THE PATTERN OF INDUSTRIALISATION IN INDIA -
AN ANALYSIS OF THE CHANGING RURAL
URBAN SCENARIO DURING 1961-78

Amitabh Kundu
C. Sai Kumar
Lokesh Bratt

Centre for the Study of Regional Development
Jawaharlal Nehru University
New Delhi 110067

Paper to be presented at the Seminar on
"Development and Inter-regional Disparities
in India" to be held at the Giri Institute
during March 19-21, 1983

THE PATTERN OF INDUSTRIALISATION IN INDIA
- AN ANALYSIS OF THE CHANGING RURAL :
URBAN SCENARIO DURING 1961-78

Amitabh Kundu

C. Sai Kumar

Lokesh Bhatt

1. The Setting

Empirical research on the spatial structure of industrial development is seriously constrained by the absence of time series data at the regional and sub-regional levels. The Annual Survey of Industries (ASI), which happens to be the information base for most of the scholars analysing the Indian industrial structure, has the following important limitations:

(a) The Survey covers only the factories registered under the Factories Act of 1948, barring a few exceptions like the inclusion of electricity generation and distribution, gas and steam, waterworks, cold storages, repairs etc. and the exclusion of the units under defence production and training institutions etc. There is, thus, no systematic information on the 'unregistered' industries in the country that comprise above ninety five percent of the total industrial units.

(b) The Survey is using the National Industrial Classification (NIC) of 1970 for the presentation of the data since 1973-74. This makes the information for the earlier years five and sometimes even six non-comparable, unless one goes to four-digit classification of the industries and builds up fresh time series data.

(c) The Central Statistical Organisation (CSO) is publishing summary results for all the ASI units since 1973-74 which has greatly facilitated research on the pattern of industrial development at the two digit level of classification. Construction of comparable data for the years prior to 1973-74 would involve enormous work and problems of categorisation for a number of minor industries, some of which may not be solvable.

(d) The Survey publishes data for the states and union territories of India except for Sikkim, Nagaland, Arunachal Pradesh, Dadra and Nagar Haveli and Lakshadweep (the summary results of CSO, however, cover only the major states). It is, therefore, not possible to get an idea of the changes in the spatial structure of even the registered industries within the jurisdiction of a state.

The above limitations of the ASI data have given a macro-economic bias in the studies on industrial structure in India, as these, in general, deal with the national and sometimes the state level scenarios. In view of this, the present paper attempts the following:

(1) To construct comparable state level indicators for the industries in the census sector (factories employing fifty or more workers using power and those employing more than ninety nine workers) at three points of time viz. 1961-62, 1968-69 and 1978-79 using ten digit classification (NIC) of industries and to see how the spatial distribution of these units and

and their shares in employment and value added have changed over time.

(2) To apply the criterion of industrial registration under the Factories Act (1948) viz., units employing ten to nineteen workers running on power and those employing or more twenty workers, on the data on industrial establishments collected at the time of Population Census of 1961 and 1971, and to examine how the information from these two sources viz. ASI and the population Census, help in developing a comparable picture of industrialisation in India,

(3) To use the data on 'registered' industrial units obtained as mentioned above, from the Establishment Tables and, based on this, to analyse the changing profile of inter-state and intra-state concentration of industries in India.

(4) To examine the spatial distribution and growth of unregistered units in different states, regions, sub-regions, rural and urban areas of the country and to test if there has been changes in the spatial structure during the sixties, and

(5) To examine if there has been a dispersal of industrial activities from the nine metropolitan cities ^{in 1971} to their hinterlands.

For the purposes of a time series and cross-sectional analysis of the registered as well as unregistered industries, the National Industrial Classification has been taken as the basis. The data on the Census sector of the ASI as well as that on the manufacturing

establishments from the Population Census of 1961 (that used Indian Standard Industrial Classification) have been used to generate new series on the basis of the two digit NIC classification.

In the light of the problems of non-identification of certain minor industrial groups, and in the absence of a classification regarding their classification prior to 1973-74, it has become necessary to club together four major industrial divisions viz. 23, 24, 25 and 26 into one. In the spatial dimension, the states of Punjab, Haryana and Himachal Pradesh have been clubbed into a single unit as separate information for them could not be obtained for the year 1961.

2. Interstate Variation in Industrial Development - A Temporal Analysis Based on ASI (Census Sector) Data.

The analysis of the structure of industries belonging to the ASI Census sector, as attempted in Table I and II, reveals that the interstate variation in the share of the number of units, employment and value added in the national totals is similar to that of the total registered industries (ASI, factory sector). There has been a marginal shift of industries away from the fifteen major states covered in these tables during 1961-68 but in the subsequent decade the trend seems to have been reversed. The relative position of the states did not undergo any major change during the total period covered in the analysis, as the

rank-correlations of each indicator with the corresponding indicators for other years in Table II work out as highly significant. The striking feature, however, is the improvement and deterioration in the relative positions of Andhra Pradesh and Assam respectively. West Bengal which suffered considerable loss in its share over time in all the three indicators, however, maintained its rank among the states. It may be noted that West Bengal and Maharashtra, among the industrialised states, and Assam, Orissa, Jammu and Kashmir, Kerala and Madhya Pradesh, among the industrially backward states, experienced declines in their shares in the number of industries during 1961-78. This, however, has not meant a fall in the shares in value added in case of most of the less industrialised states. This is indicative of the location of a few large units in these states which may be attributed to the governmental policy of industrial dispersal in the country. Andhra Pradesh and Rajasthan, the other two backward states of the country, however, gained in their shares of all the three indicators.

The spatial profile of industrialisation in India, however, did not change much despite the new developments mentioned above. This is because the process of industrial dispersal in favour of the backward states have been rather weak and, at this rate, it would take decades before a dent is made on the regional imbalances in the levels of industrial development in India.

The distribution of industries by nineteen major NIC groups indicates a high degree of regional specialisation.¹ In four

1. Shetty(1982), too, has noted this phenomenon in his analysis of industrial structure based on ASI factory sector data.

of the states viz. Assam (food products) Gujarat (all textiles), Jammu and Kashmir (all textiles) and Orissa (others), a single group accounts for more than sixty percent of value added by the ASI Census sector industries in the state. The share of the most important industry in value added happens to be larger than twenty four percent in all the states while the largest three account for more than sixty-five percent. It is, however, true that the shares of major industrial groups in total number of units, employment and value added have gone down over time for dominant states. Nevertheless, the regional specialisation in industrial activities emerge as conspicuous even in 1978-79.

The changes in the interindustrial composition of the units, employment and value added (Census sector) in the country as well as for individual states have several other interesting features. A very high growth rate was recorded in case of Gas and Steam, Electricity and Repairing services (see Table III), although these are not parts of the manufacturing sector as per the National Industrial Classification. The manufacturing industries exhibiting high growth in their value added during 1961-62 and 1968-78 are the Chemicals and chemical products, Paper and printing, Basic metals, Machinery both electrical and non-electrical. The only industry growing fast during both the time periods covered in the study, that can be considered as agro-based, is the Wood and wood products which is largely dependent on the urban demand. Of these industries, the one showing a rapid growth in the number of units as well, is Chemicals and

chemical products. Rubber, plastic, petrol and coal products and Beverages, tobacco etc also showed a high growth in their number of units during 1968-78 although their growth in employment or value added has been just about the average. Textiles, on the other hand, suffered a loss in their shares in all the three indicators during 1961-78.

3. The Structure of Organised and Unorganised Industries²An Analysis of the Data on Industrial Establishments

Information on the 'Manufacturing Processing and Servicing' establishments in different size and fuel utilisation categories are available from the Establishments Tables for the various census years. Since a separate schedule was canvassed to obtain information on industrial establishments in 1971 census, disaggregative data on employment for different industrial categories are also available. Table IV gives the percentage distribution of the industrial establishments belonging to the organised and unorganised sectors for the fifteen major states. Table V presents the distribution of employment in these sectors by rural and urban areas. It may be worthwhile to repeat here that the units working with power employing ten to nineteen workers and those employing twenty or more workers have been identified as belonging to the organised sector. The unorganised sector is then the residual category i.e. the total manufacturing, processing and servicing establishments less the units classified as belonging to the organised sector.

2. The number of units belonging to the organised sector in
See Housing and Establishment Tables, Part IV (B), 1961 and
Establishment Tables Part III B (i) and (iii) Census of India 1971.

in 1970-71 are reported to be 64565 by the ASI (industries covered by the ASI are taken as comprising the organised sector) while the Establishment Tables report this to be 87807, the latter being larger than the former by thirty six percent. It may be noted that the number reported by the Labour Bureau of the Government of India is over thirty percent higher than that reported by ASI in 1978-79. The discrepancy can perhaps be explained by the exclusion of the industrial units coming under Defence Departments and Technical training institutions and that of the restaurants and cafes in the ASI.

The spatial pattern of 'registered' industries emerging from data on industrial establishments in 1961 and 1971 seem to be similar to what has been noted in the previous section based on the census sector (ASI) data. This enhances our confidence in the use of Establishment Tables data for a disaggregative analysis of the industrial structure at the regional and sub-regional levels.

The spatial distribution of the unorganised sector reveals an interesting pattern. The backward states like Madhya Pradesh, Uttar Pradesh, Bihar and Orissa claim a share of about ten percent of more each, in the national total of the unorganised industries. Similar picture emerges when one considers the statewise distribution of employment in the unorganised sector. In case of the economically underdeveloped states like Jammu and Lashmir, Kerala, Rajasthan, Orissa and Uttar Pradesh barring Bihar and Assam, the shares in population are less than that in the unorganised industrial units or employment therein specially in the rural areas. The shares of all these states have gone down during sixties. Uttar Pradesh is an exception to this and this may be explained in terms of a higher growth rate of the unorganised as well as organised industrial.

activities in the western region of the state. Gujarat, Karnataka and Punjab that had a low base of unorganised sector, improved their positions considerably during 1961-71. The cross-sectional analysis of the incidence of organised and unorganised industries in 1961 suggests a competitive relationship between them. The trend during sixties, however, makes a significant departure from the past as the unorganised sector grew pretty fast (during 1961-71) in the states that had a developed industrial (organised sector) base.

An analysis of the spatial distribution of industries in nineteen major groups both for organised and unorganised sectors tends to support the hypothesis of regional specialisation as established based on the census sector data in the previous section. One observes that for each industrial group, one or two states emerge as major producer/producers. The names of the states that account for a substantial portion of the total units in each industrial group in 1961 have been shown (in brackets) below.

Food products (Uttar Pradesh), Beverages & tobacco (Madhya Pradesh and Maharashtra), Cotton textiles (Tamil Nadu), Silk and synthetic fibres (Uttar Pradesh), Jute and hemp textiles (West Bengal and Maharashtra), Textile products (Maharashtra), wood and wood products (Orissa and Madhya Pradesh), Paper and printing (West Bengal and Maharashtra), Leather and fur (Madhya Pradesh), Rubber, plastics etc. (West Bengal and Maharashtra), Chemical and chemical products (Kerala and Uttar Pradesh), Non-metallic minerals (Madhya Pradesh and Bihar), Basic metals and Alloys

(Maharashtra and Tamil Nadu), Metal products (Madhya Pradesh), Machines except electricals (Gujarat and Punjab), Electrical machinery (West Bengal and Maharashtra) and Transport Equipments (Punjab, TamilNadu and Maharashtra).

The picture remains more or less the same except for a few changes in 1971. Uttar Pradesh, for example, comes on the industrial map in a big way largely because of the industrial growth in the western parts of the state as mentioned above. The state claims a major share of units in Transport equipments, Machinery except electricals, Basic metals, Non metallic minerals, Chemical and chemical products and Textile products industries. Similarly, Andhra Pradesh becomes a dominant state in Beverages and tobacco, Wood and wood products, Jute hemp textiles, Karnataka in Silk and synthetic fibre and Punjab in Jute and hemp textiles. The developed states that lost their dominance in different industries are Maharashtra (Transport equipment and Jute and hemp textiles), Tamil Nadu (Transport equipments and Basic metals) and West Bengal (Jute and hemp textiles). In addition, Uttar Pradesh went down the scale relatively in Silk and synthetic fibre and Orissa in wood and wood products.

4. Rural Urban Dichotomy in Industrial Development.

The distribution of the number of units and employment in the organised sector reveals their concentration in urban areas (and more specifically metropolitan cities i.e. with more than a million population). This is not so in case of the unorganised sector as the factors responsible for economies of scale, leading to industrial agglomeration in urban areas, would be less important.

The share of the urban centres in the total organised manufacturing units of the state happens to be low in Assam, Kerala, Bihar and Orissa, all these being industrially backward states. The corresponding shares of Karnataka, Gujarat, Maharashtra and Punjab are very high, the figure being about or more than eighty percent in 1961 in all these cases. This suggests that the process of industrialisation in India has been associated with that of industrial concentrations in urban areas. A further disaggregative picture (based on establishment data) shows that in these industrially developed states, one or two cities claim more than sixty percent of industrial units or workforce.

It is heartening to note that the share of the urban areas in the organised industrial units has in general, gone down during 1961-71. The fall is significant in cases of West Bengal, Tamil Nadu, Karnataka, Punjab but not for Maharashtra and Gujarat. In the poorer states the industrial concentration in urban areas has risen over the decade, the states of Assam, Bihar, Jammu and Kashmir, Rajasthan being illustrative examples.

The incidence of the unorganised industrial units in urban areas is markedly lower than that of the organised units in 1961. It is also interesting that the share of the urban areas in the total establishments in the unorganised sector happens to be lower in the industrially undeveloped states like Bihar, Jammu and Kashmir, Madhya Pradesh and Orissa, compared to the other states. It is, however, higher than the corresponding shares for these (poorer) states in organised industries. The concentrations of unorganised industries in the state, with a relatively lower incidence of these industries in urban areas, has increased during sixties. A reverse trend is observed in case of indust-

rially developed states of Karnataka and Punjab. The urban share, however, did not decline in Maharashtra, West Bengal, and Tamil Nadu which can be attributed to the growth of informal activities in their metropolitan cities.

Industries like Paper and Printing, Rubber and Plastics, Chemicals and chemical products, Basic metals, Electrical and Non-Electrical machinery, that depend largely on the final demand of the urban consumers, show an excessive concentration (of their units) in urban areas. It is important to know that most of these industries are concentrated in the urban areas of Maharashtra, West Bengal, TamilNadu, and Gujarat, the four metropolises, located therein, claiming a very large share. The agro-based industries like Food products, Beverages, Leather and Fur products, Wood and furnitures etc. understandably do not show an excessive location bias in favour of urban centres.

An analysis of the growth rates of industrial units in seven largest metropolitan cities reveals that the industries, exhibiting distinct urban bias in 1961, continued to grow at a fast rate in these cities during 1961-71 as well. It is, therefore, not very surprising that despite the dispersal of certain industries in the backward states or rural areas, the special scenario remains by and large unchanged.

5. METROPOLISES AND THEIR HINTERLAND - A TREND TOWARDS INDUSTRIAL DISPERSAL

So much has been said in favour of and against the role of large cities in the context of their dissemination of growth inputs in the hinterland and strengthening of the industrial base in the regional economy that the current discussions tend to be based on other people's assertions than on empirical evidence and consequently get charged with emotional and ideological fervor. In an attempt to provide an empirical basis to some of the debatable postulations in this area, nine Indian metropolises viz. having a population size of more than a million in 1971, have been chosen for a detailed investigation. In view of the controversies regarding the methodology of regionalisation, it is proposed to define metropolitan regions simply by putting together the districts around each metropolis within the state(except for Delhi). Lucknow, which became a million plus centre only in 1981 has also been included in the study because of its proximity to Kannur and a combined region has been delimited for these two cities. Similarly, a single region has been identified for Bombay and Pune to avoid overlapping of districts between the regions. The composition of metropolitan regions is indicated below:

| <u>Identifying City</u> | <u>Constituent Districts</u> as per the 1981 Census |
|-----------------------------------|--|
| 1. Calcutta | Calcutta, Hoora, Nadia, Midnapur, Hoogly, Twenty four Paraganas. |
| 2. Greater Bombay-Pune Greater | Greater Bombay, Thane, Kulaba, Pune, Ahmadnagar, Satara, Solapur, Ratnagiri. |

| <u>Identifying City</u> | <u>Constituent Districts</u> as per the 1981 Census |
|-------------------------|--|
| 3. Delhi | Delhi, Sonipat, Rohtak, Gurgaon, Bulandshahr, Gaziabad, Meerut. |
| 4. Madras | Madras, Chingalpattu, North Arcot, South Arcot. |
| 5. Bangalore | Bangalore, Kolar, Tumkun, Mardva, Mysore. |
| 6. Hyderabad | Hyderabad, Rangareddy, Medak, Nalgonda, Mehboobnagar, Karimnagar, Nizamabad. |
| 7. Ahmedabad | Ahmedabad, Kheda, Sabar Kantha, Surendranagar, Mahesana. |
| 8. Kanpur-Lucknow | Kanpur, Lucknow, Bara Banki, Rai-Bareli, Fatehpur, Hamirpur, Jalaun, Farrukhabad, Hardoi, Sitapur. |

It is striking that in four of the seven regions, urban centres had more than ten percent of their male workers engaged as cultivators in 1961 while the all India urban figure is only 5.56 percent. Similar picture emerges in case of the share of agricultural labourers as well. From this, one would infer that the towns under the shadow of these cities do not enjoy an adequately diversified economic base. However, during 1971-81, the share of the cultivators in these regions, excepting Delhi and Kanpur-Lucknow³ regions, fell more sharply than for the country.

3. In case of Kanpur-Lucknow region, this is understandable, as a large number of settlements with substantial agricultural base have appeared as towns in the 1981 Census.

The shares of workers in other than household industries in urban areas of these regions are equal to or less than the corresponding figure for urban India in 1961. The only exception to this is the Calcutta region. This is largely due to the fact that the urban centres falling within the Calcutta urban agglomeration(excenting Calcutta) have been treated as part of the urban segment of the region. The rural areas in the metropolitan regions too generally do not have a developed base of non-household manufacturing activities, the cases of Bangalore, Ahmedabad and Kanpur-Lucknow being very alarming. The low share of the manufacturing sector in the male work-force in several regions is an indication of the process of deindustrialisation during the colonial period, the impact of which was felt more sharply in the vicinity of the main centre. The household industries, that bore the brunt of the colonial policy of expanding their market, managed to survive in the relatively backward regions, in small towns and in rural areas where the impact of the modern industries has been minimal. As a result, even after ten to fifteen years of independence, the incidence of household industries happens to be, in general, lower in the rural and urban areas within the metropolitan regions compared to the country as a whole⁴. It is heartening that the spatial pattern of industrial growth during sixties marks a departure from the past trend as employment in both household as well as non-household manufacturing activities in most of the regions increased at a pace faster than that of the country. Also, the competitive relationship between the above two components of the manufacturing sector seems to be

4. See Kundu and Sharma (1983)

undergoing a transformation as the household industries have grown pretty fast in large cities and developed regions.⁵ Its growth has been particularly impressive in the metropolitan cities and the towns in their hinterland.

The factors responsible for this limited dispersal of the manufacturing activities within the metropolitan regions may not be diseconomies of agglomeration in all cases. The Master Plans aimed at improving the living conditions of the city population and at providing a "pollution free environment". have explicitly incorporated the policy of discouraging industrial concentration, specially by encouraging the location of large industrial units away from the cities. The Census data on manufacturing, processing and servicing establishments bear a clear testimony to this. The number of units employing fifty to hundred and those employing more than hundred workers have grown at a snails pace in all the metropolises while in four of these, even the absolute number in one of the above two categories has declined during 1961-71. Calcutta MC, however, is a unique case where the numbers in both the categories have come down significantly together with the absolute number of (male) workers during the same period. This declining trend is noted also in Calcutta urban agglomeration and the rural areas in the region. Nonetheless, the population in all metropolitan cities have continued to grow, as the informal sector has shown an enormous capacity for labour absorption on the face of a negatively sloping supply curve in the labour market.

5. See Kundu and Moonis Raza (1982)

The growth of this sector in these cities is indicated by the phenomenal increase in the number of establishments with less than ten workers, the growth rate for Delhi being as high as four hundred and fifty percent during sixties. The fact that the expansion in the informal job opportunities during seventies has been higher than that of the preceding decade and the establishment data from the Census can give but an underestimation of the actual situation, is evident from a number of micro level studies.

References

- Kundu, A. and Moonis Raza (1982): Indian Economy- The Regional Dimension, Jawaharlal Nehru University, New Delhi.
- Kundu, A. and Sharma, R.K. (1983): "Industrialisation, Urbanisation and Economic Development in India - The Need for an Alternate Explanation" Urban India (Forthcoming)
- Shetty, S.L. (1982): "Industrial Growth and Structure: As Seen through Annual Survey of Industries" in Economic and Political Weekly, Vol 17 No. 40

TABLE-I Statewise Distribution of Industrial Units, Employment,
 Value Added-Annual Survey of Industries(Factory Sector)
 1978-79

| | | Population | Unit | Employment | Value-added |
|-------------------------|----------------|------------|-------|------------|-------------|
| 1. | Andhra Pradesh | 7.94 | 11.29 | 8.89 | 4.93 |
| 2. | Assam | 2.73 | 1.78 | 1.75 | 1.66 |
| 3. | Bihar | 10.28 | 4.83 | 5.38 | 5.43 |
| 4. | Gujrat | 4.87 | 11.33 | 9.14 | 9.33 |
| 5. | J & K | 0.84 | 0.34 | 0.32 | 0.14 |
| 6. | Karnatka | 5.35 | 5.89 | 4.97 | 6.36 |
| 7. | Kerla | 3.99 | 3.32 | 3.65 | 2.80 |
| 8. | Madhya Pradesh | 7.60 | 3.60 | 4.13 | 3.77 |
| 9. | Maharastra | 9.20 | 16.19 | 17.66 | 25.21 |
| 10. | Orissa | 4.00 | 1.65 | 1.58 | 1.93 |
| 11. | Punjab | 4.94 | 7.98 | 5.42 | 6.07 |
| 12. | Rajasthan | 4.70 | 2.62 | 2.27 | 2.51 |
| 13. | Tamil Nadu | 7.52 | 10.51 | 9.98 | 10.02 |
| 14. | Uttar Pradesh | 16.12 | 8.07 | 9.38 | 6.23 |
| 15. | West Bengal | 8.09 | 6.70 | 12.87 | 11.18 |
| Total of fifteen states | | 98.17 | 96.10 | 97.39 | 97.57 |

TABLE II Statewise Distribution of Industrial Units, Employment & Value-added
- Annual Survey of Industries (Census Sector)

| | 1961 | Unit | Employment | Value-added | Unit | Employment | Value-added | 1968 | Unit | Employment | Value-added | 1978 | Employ- ment |
|-------------------------|-------|-------|------------|-------------|-------|------------|-------------|------|-------|------------|-------------|------|-----------------|
| Andhra Pradesh | 4.89 | 4.33 | 2.38 | | 5.87 | 5.91 | 3.35 | | 8.62 | 7.50 | 4.81 | | |
| Assam | 4.79 | 1.68 | 1.93 | | 3.94 | 1.78 | 0.99 | | 2.83 | 1.93 | 1.72 | | |
| Bihar | 3.04 | 5.43 | 5.09 | | 3.10 | 5.52 | 6.26 | | 4.17 | 5.66 | 5.78 | | |
| Gujrat | 9.24 | 10.60 | 10.70 | | 8.88 | 8.22 | 7.85 | | 10.52 | 8.55 | 9.05 | | |
| J & K | 0.44 | 0.27 | 0.11 | | 0.27 | 0.25 | 0.14 | | 0.35 | 0.32 | 0.11 | | |
| Karnatka | 4.31 | 4.02 | 3.83 | | 4.38 | 4.41 | 5.11 | | 5.82 | 5.04 | 6.73 | | |
| Kerla | 6.03 | 4.77 | 2.52 | | 4.99 | 4.33 | 3.63 | | 4.08 | 3.67 | 2.67 | | |
| Madhya Pradesh | 6.54 | 3.07 | 2.72 | | 4.95 | 3.29 | 3.61 | | 4.10 | 4.26 | 3.85 | | |
| Maharashtra | 19.55 | 22.03 | 28.82 | | 21.06 | 19.84 | 26.96 | | 17.00 | 18.16 | 25.20 | | |
| Orissa | 1.11 | 0.83 | 1.10 | | 1.71 | 1.86 | 1.71 | | 1.02 | 1.70 | 2.07 | | |
| Punjab | 4.27 | 2.55 | 2.68 | | 3.05 | 1.95 | 2.17 | | 7.03 | 5.04 | 5.59 | | |
| Rajasthan | 1.26 | 1.14 | 0.90 | | 1.38 | 1.76 | 1.74 | | 1.90 | 2.18 | 2.54 | | |
| Tamil Nadu | 8.75 | 6.77 | 7.54 | | 10.03 | 9.68 | 9.22 | | 9.76 | 9.52 | 9.81 | | |
| Uttar Pradesh | 6.54 | 8.67 | 6.94 | | 6.71 | 6.92 | 6.65 | | 10.13 | 9.64 | 6.21 | | |
| West Bengal | 16.19 | 22.35 | 20.99 | | 14.01 | 13.79 | 16.29 | | 9.30 | 14.51 | 11.72 | | |
| Total of fifteen States | 97.78 | 98.51 | 98.25 | | 94.33 | 94.51 | 95.68 | | 96.63 | 97.68 | 97.86 | | |

TABLE III Growth Rates of Units, Employment and Value Added -
Annual Survey of Industries (Census Sector)

| NIC Code | Description | 1961 - 68 | | 1968 - 78 | |
|----------|-----------------------------------|-----------|------------|-----------|-------------|
| | | Unit | Employment | Unit | Employment |
| | | | | | Value added |
| 20-21 | Food Products | 9.31 | -2.79 | 53.05 | 61.52 |
| 22 | Beverages, Tobaccos, its products | -4.37 | 3.38 | 179.54 | 133.56 |
| 23-26 | Textiles | 9.62 | 0.81 | 53.16 | 37.49 |
| 27 | Wood and its products | 18.99 | 54.08 | 107.43 | 5.63 |
| 28 | Paper and Printing | 53.30 | 41.47 | 99.72 | 2.77 |
| 29 | Leather, fur etc | 68.22 | 58.54 | 163.56 | -10.55 |
| 30 | Rubber, plastics, petrol prod. | 83.84 | 82.91 | 144.13 | 142.31 |
| 31 | Chemicals and its products | 68.75 | 58.19 | 184.23 | 55.95 |
| 32 | Non-metallic minerals | 33.42 | 21.29 | 91.98 | 29.28 |
| 33 | Basic Metals | 91.01 | 77.79 | 160.50 | 40.00 |
| 34 | Metal products | 63.77 | 28.04 | 90.47 | 0.00 |
| 35 | Machinery except elect. | 103.54 | 103.86 | 217.07 | 10.54 |
| 36 | Electrical machinery | 97.32 | 100.09 | 182.74 | 18.45 |
| 37 | Transport Equipment | 83.51 | 62.64 | 169.46 | 7.30 |
| 38. | Others | 70.51 | 75.26 | 1.58 | -40.35 |
| 40-41 | Gas & Steam Electricity | 197.71 | 870.79 | 909.22 | -42.05 |
| 97 | Repairs | 110.47 | 95.21 | 208.09 | 24.70 |

TABLE IV

Statewise Distribution of Industrial Units and the Share of Urban Areas

| | 1. | Andhra Pradesh | Percentage share in the National Total | | Percentage in Urban Areas (Organised) 1961 1971 | Percentage in Urban Areas (Organised) 1961 1971 |
|-----|-------------------------|----------------|--|--------------------------|--|--|
| | | | Unorganised Sector 1961 | Organised Sector 1971 | | |
| 2. | Assam | 6.31 | 8.73 | 5.20 | 6.73 | 23.04 25.65 65.04 |
| 3. | Bihar | 0.43 | 0.94 | 2.12 | 1.83 | 36.68 35.92 25.13 28.74 |
| 4. | Gujarat | 10.18 | 6.40 | 4.11 | 2.93 | 16.75 23.54 46.76 51.30 |
| 5. | Jammu & Kashmir | 3.30 | 5.33 | 5.49 | 6.24 | 56.15 46.38 81.83 79.30 |
| 6. | Karnataka | 1.77 | 1.46 | 0.64 | 0.21 | 10.74 23.87 60.67 75.34 |
| 7. | Kerala | 3.85 | 5.50 | 4.13 | 5.46 | 46.95 40.46 79.09 69.71 |
| 8. | Madhya Pradesh | 2.39 | 2.99 | 4.94 | 3.60 | 32.31 28.88 43.05 36.23 |
| 9. | Maharashtra | 17.18 | 11.93 | 3.91 | 3.22 | 16.58 19.94 67.98 61.94 |
| 10. | Odisha | 13.36 | 9.70 | 15.03 | 12.88 | 35.84 41.47 80.04 83.52 |
| 11. | Punjab, Haryana & H.P. | 3.52 | 4.03 | 1.02 | 1.89 | 4.81 12.43 53.36 36.71 |
| 12. | Pakistan | 4.37 | 5.92 | 5.44 | 5.09 | 32.21 38.16 85.33 72.69 |
| 13. | Tamil Nadu | 1.86 | 5.64 | 1.06 | 2.09 | 40.57 31.75 79.92 84.12 |
| 14. | Uttar Pradesh | 7.99 | 7.80 | 10.04 | 13.54 | 55.04 55.34 72.40 56.22 |
| 15. | West Bengal | 10.12 | 15.95 | 6.69 | 10.41 | 33.81 32.73 62.14 44.35 |
| | | 6.46 | 6.46 | 14.56 | 8.78 | 39.25 40.69 70.76 60.84 |
| | Total of fifteen States | 99.15 | 98.50 | 84.39 | 84.91 | 28.91 33.55 70.76 60.84 |

TABLE V Statewise Distribution Population, Workforce in Organised and Unorganised Sectors - 1971

| State | Rural Population | | | Urban Population | | | Share of Urban areas in the Industrial employment | | |
|-------------------------|----------------------|------------------------|-------|----------------------|------------------------|-------|---|-------------|--|
| | Organised Workers | Unorganised Workers | Total | Organised Workers | Unorganised Workers | Total | Organised | Unorganised | |
| Andhra Pradesh | 8.00 | 11.02 | 11.94 | 7.70 | 5.51 | 6.56 | 53.09 | 28.03 | |
| Assam | 3.11 | 5.55 | 0.96 | 1.22 | 0.58 | 1.09 | 19.18 | 44.77 | |
| Bihar | 11.56 | 4.31 | 7.40 | 5.16 | 3.53 | 4.24 | 64.95 | 28.91 | |
| Gujarat | 4.37 | 4.09 | 3.97 | 6.87 | 7.16 | 6.82 | 79.84 | 54.94 | |
| Jammu & Kashmir | 0.86 | 0.46 | 1.14 | 0.79 | 0.24 | 0.89 | 54.50 | 35.53 | |
| Karnataka | 5.05 | 3.10 | 4.97 | 6.53 | 6.73 | 6.26 | 83.09 | 47.18 | |
| Kerala | 4.07 | 10.86 | 4.16 | 3.18 | 2.22 | 0.66 | 31.65 | 10.16 | |
| Madhya Pradesh | 7.94 | 3.16 | 12.18 | 6.22 | 4.40 | 5.62 | 75.93 | 24.66 | |
| Maharashtra | 7.91 | 10.02 | 7.60 | 14.40 | 25.03 | 12.80 | 84.97 | 54.45 | |
| Orissa | 4.58 | 1.74 | 5.23 | 1.69 | 1.25 | 1.30 | 61.94 | 15.00 | |
| Punjab, Haryana, H.P. | 4.97 | 6.02 | 4.25 | 4.79 | 4.37 | 6.10 | 53.42 | 50.48 | |
| Rajasthan | 4.84 | 1.17 | 5.03 | 4.16 | 0.22 | 4.23 | 81.33 | 37.39 | |
| Tamil Nadu | 6.55 | 8.23 | 6.08 | 11.43 | 7.80 | 12.10 | 68.20 | 58.58 | |
| Uttar Pradesh | 17.31 | 19.26 | 17.31 | 11.36 | 8.51 | 14.96 | 50.01 | 38.00 | |
| West Bengal | 7.60 | 9.43 | 6.89 | 10.05 | 17.40 | 9.77 | 80.67 | 50.15 | |
| Total of fifteen States | | | 98.72 | 98.42 | 99.11 | 95.55 | 94.95 | 93.40 | |

INTERREGIONAL INDUSTRIALIZATION IN INDIA:
ROLE OF URBANIZATION AND URBAN STRUCTURE

Kiran Wadhva
and
S.P. Kashyap

Paper presented in the Seminar on 'Development and
Interregional Disparities in India' held at Giri
Institute of Development Studies, Lucknow on 19-21
March, 1983

Sardar Patel Institute of Economic and Social Research
Thaltej Road, Ahmedabad 380054

INTERREGIONAL INDUSTRIALIZATION IN INDIA: ROLE OF URBANIZATION AND URBAN STRUCTURE

Kiran Wadhva
and
S.P. Kashyap *

Introduction

The manifestation of interregional industrial disparities in India has aroused considerable apprehensions in official and academic quarters. Third Plan onwards the development of backward areas or States has been a matter of active public policy and various measures - physical and financial - have been adopted for overcoming inter-regional imbalances.

... Notwithstanding this concern, the search for factors explaining the observed disparities has been largely unproductive. This is because most of the recent research efforts in this area have been primarily concerned with delineating the industrial structure across the states. Not much attention unfortunately is paid to the processes that might have determined the observed structure of inter-state industrialization. It is not our intension to deny the considerable merit of structural studies. On the contrary it must be recognised that some of the findings

* Authors are grateful to Mr. Narendra Bushri and Mr. D.H. Parikh for the statistical assistance.

of structural studies - emergence of 'nascent industrial complexes across states; ^{1/} distinct possibility that clustering of industrial activities across various space points confer productivity advantages, ^{2/} inter-temporal stability of interregional industrial diversification patterns, ^{3/} and slow but continuous convergence in inter-state industrial disparities ^{4/} - give valuable insight into the spatial dimension of the Indian economy and could help in exercises relating to multi-level planning.

The need undoubtedly exists for further research that could help us in identifying factors determining inter-regional industrialization. This is particularly so because findings of some of the recent studies in deterministic frame are not much help in understanding the observed phenomenon. For instance to say that, "... the larger the size of the factories and the more developed the small [unregistered] industry, the greater will be development of large industry in a State" ^{5/}, is perhaps not very illuminating. Similarly, some of the findings, such as, social and economic infrastructure not having an important say in inter-state industrialization, though interesting, are negative in character. ^{6/}

Amongst the variables that could have/a significant impact on inter-state industrial pattern, the inadequate inclusion or total exclusion of urbanization and urban structure is most striking. This is surprising considering

that an early study by D.U. Sastry, which is now decade and a half old, showed that, apart from per capita income, the size of urban population had an important role in explaining the interregional industrial pattern.^{7/}

Role of Urbanization and Urban Structure

The role of urbanization and urban structure has in the Indian economy remained largely an unresearched subject, because the economists have been primarily occupied with the rural phenomenon. Urban poverty has been largely viewed as the overflow of rural poverty^{8/} and the same perhaps could be said about other problems of urban areas.

It may be recalled here that during the mid-fifties and the early sixties urbanization per se was considered undesirable for the developing countries. It was suggested that the third world countries, including Asia, showed pattern of urbanization which suffered from over-urbanization and cities rather than being active agents of modernization and social change depicted village characteristics and remained agglomeration of villages. By overurbanization it was implied that at comparable level of urbanization the developed countries of today had correspondingly a greater proportion of their labour force engaged in non-agricultural occupations. Such a process of urbanization in less developed countries

supposedly had resulted mainly because rural-migrants were pushed to cities rather than being pulled as a result of industrialization and economic development.

N.V. Sovani, who carefully examined the evidence at that time, showed that the overurbanization thesis was based on "bad logic, bad history, bad statistics, all combined into one."^{9/} Urbanization in India also did not show any skewed or abnormal pattern of development.^{10/} Savani's critical examination of the form and content of urbanization in India further indicated several resemblances between the Indian urbanization with that of the West, though it showed some differences. In contrast to the fluid caste system and nuclear family in the Western urban life, the Indian scene showed persistent dominant role of the caste and the family system. Cities in India, on the other hand, had all the other universal structures of industrial cities - democracy, bureaucracy, permissive religious norms, mass education, developed system of communication, water and power supply. Sovani thought that the differences were not such as to "constitute an additional handicap in India's efforts at economic development."^{11/}

Not urbanization as such, but public policy continues to view large cities (particularly metropolitan centres) with considerable disfavour. This is apparent from the efforts that are made to steer the industry to

small cities or towns or rural areas. It appears to us that the policy is not based on the proper assessment of facts. There is no evidence of big cities growing at a higher rate than the small ones.^{12/} Nor could it be categorically stated that the ugly features of large cities (slums, queuing up for facilities and crowding) stem merely from the largeness.^{13/} On the contrary the efforts at steering away the industry from large cities have not been unqualified successes. These have mostly resulted either in failures or in moderate successes in areas that were close to the urban centres.^{14/}

On the positive side, the study of the structure of a city economy (Ahmedabad) and preliminary cross-section (where more than 30 cities having population ranging from 3 to 18 lakhs were considered)suggested^{15/} that: (1) clustering of industrial units in the city was not only due to agglomeration economics (utilization of scale economies, access to large pool of skilled labour, and availability specialized and auxiliary industrial and repair facilities etc.) but also because strong inter-industrial linkages prevailed (2) City size (population) and area under industry were observed to be a highly correlated phenomenon. It could thus be inferred that firms tended to cluster at different space points (due to agglomeration economics and inter-industry linkages) and the size of the cluster tended to grow along-with the size of the city.

It must be stressed that rather than being viewed in isolation, the large cities should be treated as a part of the national urban hierarchy. Nevertheless there are strong reasons to believe that there is a positive association between the city size and modernization and social changes. Large cities as a part of urban hierarchy provide a net-work for the diffusion of social, institutional and technical change over the national space economy. As Hoselitz observes "The primate cities of Asia/are the most important centres of cultural change, especially in those fields which vitally affect economic development: advanced education, new forms of business organization, new administrative practices, and last but not least, new technologies find a fertile soil in them; their intermediate position between East and West, their land of many traditional bonds make them eminently suitable vehicles for the introduction of new ideas and new techniques."^{16/} Sovani adds, "... what is true of primate cities in Asia is also true of the big cities in India, where there is no primate city."^{17/} It may be mentioned that, given the fact most of the states in India are larger (in terms of population and area) than most countries in the world, the large cities when mapped across the states assume the / of primate cities.^{18/}

The role of cities in developing countries, thus may not be merely limited economic growth and industrialization but is much wider in terms of providing hierarchy

of network for diffusion of social institutions and technical change. Yet, it deserves to be underscored that there are considerable economic advantages of large cities that primarily arise out of agglomeration economics. For instance, a study of 40 developing countries by K. Meera showed that there was strong positive association between aggregate growth performance and increasing primacy.¹⁹

The questions, like, whether there are in an overall sense economies of scale with respect to city size, or whether agglomeration economies increase with the city size can not be answered in the context of India. This is because the published information gives no clue to pattern of industrialization across the cities. But the evidence in the case of developed countries is quite revealing. David Segel in the context of the U.S. economy finds that constant returns to scale obtain across different sized cities and an "... agglomeration effect, implied in the constant term of the production function for the largest cities, makes units of capital and labour 8 per cent more productive in these cities."^{20/} Similarly Leo Srikanskar, again in the context of U.S.A., finds that "... a doubling of city size is typically associated with a 5.98 per cent increase in labour productivity."^{21/} Richardson mentions that behaviour of entrepreneurs suggests that the relative productivity arising out of agglomeration economies is even greater in developing countries, which more than counter-balance non-monetary negative externalities.^{22/}

Method, Concepts and Empirical Analysis

In the earlier narration we outlined the role which agglomeration economics play in the location of industrial activities. We believe that this factor (agglomeration), more than any other, explains concentration of economic activities in metropolitan centres and large cities. We, therefore, hypothesise that primacy in a region is a significant determinant of economic and specifically manufacturing activity in a region. In this part, we test this hypothesis with the help of data relating to fifteen states in the country over three points of time - 1961, 1971 and 1977-78. These fifteen states include - Andhra Pradesh, Assam (excluded for year 1977-78 due to non-availability of data), Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

In our empirical analysis, manufacturing activity has been included in terms of value added by Manufacturing Sector. We include both total and large scale manufacturing as well as per capita value added by manufacturing in our analysis as dependent variables.

In addition to testing the effect of primary on manufacturing activity we also test the effect of urbanisation on these variables. The percentage of urban

population in total population of the state is taken to represent the level of urbanisation in a state. Primacy has been measured by the share of certain number of largest cities in total population of the state. We have used three variables for measuring concentration of population in a region --- share of largest city, share of three largest cities and share of lakh + cities in total population of the country. We also included share of these variables in urban population of the state as alternative explanatory variables.

Data : Sources and Limitations : Data on value added by manufacturing in various states have been collected from Reserve Bank of India Bulletin.²³ Data on large scale manufacturing have been obtained from various volumes of Annual Survey of Industries.²⁴ The data on population (Total and urban) relating to various states and cities have been obtained from various census volumes for years 1961, 1971 and 1981.²⁵

Per capita value added by manufacturing has been derived by dividing the value added by manufacturing by the population of the state. Whereas the population figures used for years 1961 and 1971 have been taken from the census, the ones used for the year 1977-78 have been derived by dividing by data on State Domestic Product by per capita State Domestic Product.

The choice of the years in the study was constrained by the availability of data on independent variables. We

faced a problem in relation to data for the latest point of time in our analysis. While as the latest year for which data on value added by manufacturing was available was for the year 1977-78, no corresponding data on independent variables was available. The data on population variables was available only for **the** year 1981 alone. We therefore used the population data of 1981 as a proxy variable for those of 1977-78. Since the data on independent variables in our analysis relates to share of various variables in total/urban population, we believe that using 1981 data as a proxy for 1977-78 would not make significant difference to the value of the concerned shares. This however remains one of the limitations of our data.

Another limitation of the data relates to the fact of use of value series at current prices. Though we recognise the superiority of using constant price statistics in this case, the current price data was used because of non-availability of separate deflators (for different states) for deflating value added by manufacturing in various states. Under these circumstances, the use of constant price data will not make any significant difference to our regression results.

Form of Relationship : In order to test the hypotheses mentioned in earlier paragraphs, the following linear relationships were tested :

$$Y_i = \alpha + \beta X_j$$

i = 1---4; j = 5----11

where

Y_1 = value added by manufacturing (total)

Y_2 = value added by manufacturing (largescale)

Y_3 = per capita value added by manufacturing (total)

Y_4 = per capita value added by manufacturing (large-scale)

X_5 = share of urban population in total population

X_6 = share of largest city in total population

X_7 = share of largest city in urban population

X_8 = share of three largest cities in total population

X_9 = share of three largest cities in urban population
plus

X_{10} = share of lakh cities in total population
plus

X_{11} = share of lakh cities in urban population.

In addition to the above, we tested the following two other relationships :

$$Y_i = \alpha' + \beta' X_6 + \gamma' X_{12}$$

$$Y_i = \alpha' + \beta' X_7 + \gamma' X_{13}$$

i = 1---4

where

X_{12} = share of second and third largest city in total population and

X_{13} = share of second and third largest city in urban population

These two exercises were carried out to bifurcate the impact of variable X_8 and X_9 into two parts and see the significance of the two variables separately.

The results of our regression exercises are given in Tables IA to 3D. As can be seen from these tables, even though R^2 in no case exceeds 78 and in some cases is as low as 23, the association between the dependent and independent variables (as judged by F statistics) in most of the cases is quite significant. In the following paragraphs we analyse the results of the regression exercise.

Total Manufacturing and Primacy/Urbanisation : Tables 1-A, 2-A and 3-A give details of results of regression of primacy/urbanisation on total manufacturing. In most of the cases, level of value added by total manufacturing was explained better by primacy than by urbanisation. However, coefficients of all the explanatory variables except those of X_9 , X_{12} and X_{13} were significant at 1 per cent level of significance. The coefficient of X_9 for 1977-78 was significant at 5 per cent level of significance and the coefficients of X_{12} (except in 1961) and X_{13} were statistically insignificant. Further, all the coefficients had the expected signs except X_{12} and X_{13} in 1961. Whereas X_{13} was not significant even at 30 per cent level of significance, the coefficient of X_{12} was highly significant

(at 1 per cent level). This would imply that the share of second and third largest cities in total population of the state in 1961 had a negative impact on total manufacturing activity in the state. We fail to explain this result.

For all the years studied the equation having the best fit was

$$Y_1 = \alpha + \beta X_{10}$$

Large Scale Manufacturing and Primacy/Urbanisation

As in other cases, the only variables whose coefficients were not significant were X_{12} and X_{13} (see Tables 1-B, 2-B and 3-B). By 1977-78 however the coefficient of X_{12} had become highly significant. All the coefficients had expected signs except that of X_{12} in 1961 which was statistically insignificant.

For the year 1961, the best estimated equation was

$$Y_2 = \alpha + \beta X_6 + \gamma X_{12}$$

and for the year 1971 and 1981 it was

$$Y_2 = \alpha + \beta X_{10}$$

which gave the best results.

For the year 1961, whereas coefficient of X_6 was highly significant that for X_{12} was not significant.

Per Capita Value added by manufacturing (Total and Large-scale) and Primacy/Urbanisation : In case of both these relationships all the coefficients of variables except those

of X_{12} and X_{13} in 1961 and X_{13} in 1971 and 1977-78 were significant. Further all signs were as expected except that of X_{12} in 1961 the coefficient of which was extremely insignificant.

First estimated equations for all the years concerned were $\hat{Y}_3 = \hat{\alpha} + \hat{\beta} X_6 + \hat{\gamma} X_{12}$
 $\hat{Y}_4 = \hat{\alpha} + \hat{\beta} X_6 + \hat{\gamma} X_{12}$

The other equations which gave equally good results were $\hat{Y}_{3/4} = \hat{\alpha} + \hat{\beta} X_6$ in 1977-78
and $\hat{Y}_{3/4} = \hat{\alpha} + \hat{\beta} X_8$ in 1971.

From the above, we can derive some general conclusions relating to explanatory powers of various independent variables

1. Among the various indicators of primacy selected all indicators when expressed as per cent of total population fare better than those expressed as per cent of urban population.
2. As to the explanatory power of various independent variables in relation to the dependent variables X_6 and X_7 . had the highest explanatory power in relation to large scale manufacturing in all the years. Similarly X_5 shows better relationship with respect to all per capita variables than with others.
3. In 1961 the variables X_{12} and X_{13} were insignificant variables or variables having a negative impact on

manufacturing activity. These variables overtime became more significant especially in relation to per capita manufacturing activity.

Conclusion

The above analysis shows urbanisation and primacy to be important variables in the determination of industrial activity in a state. Among the various indicators of primacy selected, all indicators when expressed as a per cent of total population fare better than those expressed as per cent of urban population. Between the two explanatory variables -- urbanisation and primacy--primacy (as expressed in terms of share of variable in total population), turns out to be a more important variable than urbanisation. Among the various indicators of primacy, it is the variables share of lakh+ cities and share of first and second plus third largest city in total population which show a higher R^2 than the other variables. Whereas share of lakh + cities is a better explanator of total and large scale manufacturing; share of first and second plus third largest city explain per capita manufacturing (both total and large scale) much better than the other variables.

Another interesting result of our empirical exercise is the increasing importance of second and third largest cities in explaining industrial activity of the states. In

1961, these variables (X_{12} and X_{13}) were either insignificant variables or variables having a negative impact on manufacturing activity. Over time, these variable became more significant especially in relation to explanation of per capita manufacturing activity.

In most of the cases, the explanatory power of primacy has declined and that of urbanisation has increased somewhat over time. The only exceptions are the relationships between urbanisation and large scale industry (showing a declining R^2 over time) and between lakh + cities and per capita manufacturing (showing an increasing R^2 over time). Primacy, however, continues to be a more significant variable in almost all the cases. Our empirical results, thus point towards the fact that urbanisation per se does not have as great an impact on industrial activity as does urban structure or concentration of population in a few cities. Government policies of decentralisation might have had some limited success (as shown by declining importance of primacy and within and primacy indicators/increasing importance of share of lakh + cities and share of second plus third largest cities in total total population) but have not been able to reverse the trend as yet.

The exercise undertaken in this paper was a first step in the direction of exploring the relation between primacy and industrialisation in Indian states. The results have been quite encouraging and indicate the need for an indepth study in this field. In view of the changing importance of primacy, it would also be interesting to see the relationship, if any, between change in primacy and industrial growth of a region.

Table-1.ADeterminants of Total Manufacturing (1961)

| Dependent Variable | Independent Variables | R ² | F |
|--------------------|--|----------------|-------|
| Y_1 | $= -4448.7 + 849.66 X_5$ (2.67)** | .37 | 7.12 |
| Y_1 | $= 1076.66 + 2696.32 X_6$ (5.09)** | .68 | 25.93 |
| Y_1 | $= -4494 + 866.75 X_7$ (4.43)** | .62 | 19.67 |
| Y_1 | $= -1251.92 + 2062.68 X_8$ (4.11)** | .58 | 16.90 |
| Y_1 | $= -13992.62 + 817.92 X_9$ (3.38)** | .49 | 11.43 |
| Y_1 | $= -1250.87 + 1528.22 X_{10}$ (6.19)** | .76 | 38.28 |
| Y_1 | $= -6983.73 + 451.89 X_{11}$ (5.17) | .69 | 26.76 |
| Y_1 | $= 3384.71 + 2934.50 X_5 - 1404.62 X_{12}$ (4.79)** (-8.07)** | .70 | 14.00 |
| Y_1 | $= -4383.23 - 865.56 X_7 - 7.04 X_{13}$ (3.96)** (-.01) | .62 | 13.29 |

Note: Figures in parentheses in each table relate to t values of the independent variables.

*denotes significance of coefficient at 5 per cent level of significance, and

**at 10 per cent level of significance.

Table 1.B

Determinants of Large-Scale Manufacturing
(1961)

| <u>Dependent Variable</u> | <u>Independent Variables</u> | <u>R²</u> | <u>F</u> |
|---------------------------|--|----------------------|----------|
| Y_2 | $= -4549.50 + 680.85 X_5$ $(2.91)^{**}$ | .44 | 8.48 |
| Y_2 | $-610.50 + 2166 X_6$ $(6.15)^{**}$ | .77 | 37.84 |
| Y_2 | $= -5500.43 + 712.18 X_7$ $(5.47)^{**}$ | .73 | 29.93 |
| Y_2 | $= -2739.1 + 1767.49 X_8$ $(5.69)^{**}$ | .75 | 32.33 |
| Y_2 | $= -15723.01 + 762.28 X_9$ $(5.25)^{**}$ | .71 | 27.54 |
| Y_2 | $= -2771.73 + 1220.81 X_{10}$ $(5.86)^{**}$ | .76 | 34.37 |
| Y_2 | $-9862.48 + 400.94 X_{11}$ $(4.56)^{**}$ | .65 | 20.79 |
| Y_2 | $= -305.16 + 2209.11 X_6 - 226.21 X_{12}$ $(4.43)^{**}$ | .78 | 21.27 |
| Y_2 | $= -10409.7 + 762.5 X_7 + 325.99 X_{13}$ $(5.37)^{**}$ | .75 | 18.00 |

Table-1.C

Determinants of Per Capita Manufacturing
(1961)

| Dependent Variable | Independent Variables | R ² | F |
|--------------------|---|----------------|-------|
| Y_3 | $= 1.15 + 2.17 X_5$ $(2.87)^{**}$ | .41 | 8.26 |
| Y_3 | $= 17.52 + 5.27 X_6$ $(4.45)^{**}$ | .62 | 19.78 |
| Y_3 | $= 5.38 + 1.97 X_7$ $(3.75)^{**}$ | .54 | 14.09 |
| Y_3 | $= 10.30 + 5.10 X_8$ $(4.25)^{**}$ | .60 | 18.06 |
| Y_3 | $= -21.23 + 2.02 X_9$ $(3.48)^{**}$ | .50 | 12.11 |
| Y_3 | $= 15.44 + 3.14 X_{10}$ $(3.77)^{**}$ | .54 | 14.23 |
| Y_3 | $= 15.33 + 6.04 X_6 + .33 X_{12}$ $(3.61)^{**}$ | .63 | 14.00 |
| Y_3 | $= -5.78 + 2.09 X_{11} + .71 X_{13}$ $(3.61)^{**}$ | .55 | 7.33 |

Table-1.D

Determinants of Per capita large Scale
Manufacturing (1961)

| Dependent Variable | Independent Variables | R ² | F |
|--------------------|--|----------------|-------|
| Y_4 | $= -9.0 + 1.76 X_5$ (2.88)** | .41 | 8.31 |
| Y_4 | $= 1.05 + 5.87 X_6$ (6.21)** | .76 | 38.60 |
| Y_4 | $= -12.21 + 1.94 X_7$ (5.78)** | .73 | 33.36 |
| Y_4 | $= -4.03 + 4.51 X_8$ (4.99)** | .67 | 24.88 |
| Y_4 | $= -37.21 + 1.95 X_9$ (4.67)** | .65 | 21.82 |
| Y_4 | $= -16.20 + .91 X_{10}$ (3.15)** | .45 | 9.93 |
| Y_4 | $= -3.43 + 3.11 X_{11}$ (4.85)** | .66 | 23.52 |
| Y_4 | $= 4.01 + 6.22 X_6 - 1.93 X_{12}$ (5.45)** (-.60) | .77 | 20.08 |
| Y_4 | $= -19.44 + 2.02 X_7 + .46 X_{13}$ (5.42)* (.56) | .74 | 17.08 |

21
Table-2.A

Determinants of Total Manufacturing (1971)

| Dependent Variable | Independent Variables | R ² | F |
|--------------------|---|----------------|-------|
| Y_1 | $= -15712 + 2289.97 X_5$ (3.19)** | .44 | 10.18 |
| Y_1 | $= 8851.82 + 4539.12 X_6$ (4.49)** | .61 | 20.12 |
| Y_1 | $= 5399.2 + 1170.29 X_7$ (3.26)** | .45 | 10.63 |
| Y_1 | $= -1033.01 + 4291.3 X_8$ (4.69) | .63 | 21.99 |
| Y_1 | $= -16461 + 1388.33 X_9$ (3.40)** | .47 | 11.55 |
| Y_1 | $= -5694.85 + 3614.98 X_{10}$ (6.01)** | .74 | 36.08 |
| Y_1 | $= -23821.3 + 1654.19 X_{11}$ (4.21)** | .58 | 17.76 |
| Y_1 | $= 1068.71 + 4415.96 X_6 + 3204.4 X_{12}$ (4.29)** (.88) | .63 | 10.22 |
| Y_1 | $= -10935.9 + 1353.14 X_7 + 1006.15 X_{13}$ (3.08)** (0.75) | .47 | 5.32 |

Table-2.BDeterminants of Large Scale Manufacturing(1971)

| <u>Dependent Variable</u> | <u>Independent Variables</u> | <u>R²</u> | <u>F</u> |
|---|------------------------------|----------------------|----------|
| $Y_2 = -13749 + 1657.6 X_5$ (3.13)** | | .43 | 9.79 |
| $Y_2 = 3129.52 + 3407.02 X_6$ (4.80)** | | .64 | 22.99 |
| $Y_2 = 707.67 + 888.80 X_7$ (3.49)** | | .48 | 12.21 |
| $Y_2 = -3789.6 + 3195.6 X_8$ (4.92)** | | .65 | 24.20 |
| $Y_2 = -15940.8 + 1055.81 X_9$ (3.66)** | | .51 | 13.41 |
| $Y_2 = -6461.62 + 2812.8 X_{10}$ (5.74)** | | .72 | 32.91 |
| $Y_2 = -18510.25 + 814.15 X_{11}$ (3.88)** | | .54 | 15.03 |
| $Y_2 = -1493.24 + 3328.85 X_6 + 2033.88 X_{12}$ (4.58)** (.79) | | .66 | 11.65 |
| $Y_2 = -11835.48 + 1018.37 X_7 + 829.2 X_{13}$ (3.31)** (.88) | | .54 | 7.04 |

Table-2.CDeterminants of Per Capita Manufacturing(1971)

| <u>Dependent Variable</u> | <u>Independent Variables</u> | <u>R</u> ² | F |
|---|------------------------------|-----------------------|-------|
| $Y_3 = -19.17 + 5.18 X_5$ (5.00)** | | .66 | 25.00 |
| $Y_3 = 43.23 + 0.47 X_6$ (4.60)** | | .62 | 21.14 |
| $Y_3 = 39.51 + 2.09 X_7$ (3.08)** | | .42 | 9.47 |
| $Y_3 = 21.64 + 0.59 X_8$ (6.07)** | | .74 | 36.84 |
| $Y_3 = -4.84 + 2.64 X_9$ (3.61)** | | .50 | 13.01 |
| $Y_3 = 21.13 + 6.31 X_{10}$ (4.98)** | | .66 | 24.82 |
| $Y_3 = 18.10 + 1.38 X_{11}$ (2.06)* | | .24 | 4.22 |
| $Y_3 = 9.93 + 7.90 X_6 + 14.65 X_{12}$ (5.21)** (2.74)** | | .77 | 20.08 |
| $Y_3 = -16.40 + 2.72 X_7 + 3.44 X_{13}$ (3.45)** (1.43) | | .51 | 6.24 |

Table-2.D

Determinants of Per Capita Large Scale Manufacturing (1971)

| Dependent Variable | Independent Variables | R^2 | F |
|--------------------|--|-------|-------|
| Y_4 | $= -22.14 + 3.77 X_5$ (4.39)** | .60 | 19.28 |
| Y_4 | $= 21.11 + 6.64 X_6$ (4.96)** | .65 | 24.59 |
| Y_4 | $= 14.37 + 1.68 X_7$ (3.38)** | .47 | 11.43 |
| Y_4 | $= 5.81 + 6.51 X_8$ (5.65)** | .73 | 34.58 |
| Y_4 | $= -15.84 + 2.05 X_9$ (3.73)** | .52 | 13.88 |
| Y_4 | $= 5.23 + 4.80 X_{10}$ (4.92)** | .65 | 24.22 |
| Y_4 | $= .348 + 1.11 X_{11}$ (2.19)* | .27 | 4.81 |
| Y_4 | $= 2.88 + 6.33 X_6 + 8.02 X_{12}$ (5.09)** (1.83)* | .73 | 16.22 |
| Y_4 | $= -15.10 + 2.05 X_8 + 1.99 X_{13}$ (3.44)** (1.10) | .52 | 6.5 |

25
Table-3.A

Determinants of Total Manufacturing (1977-78)

| Dependent Variable | Independent Variables | R ² | F |
|--------------------|--|----------------|-------|
| Y_1 | $= -16082.98 + 3791.81 X_5$ (2.87)** | .39 | 8.25 |
| Y_1 | $= 23886.5 + 8524.14 X_6$ (3.93)** | .54 | 15.49 |
| Y_3 | $= 23615.77 + 2259.39 X_7$ (2.88)** | .39 | 8.30 |
| Y_1 | $= 5527.08 + 7760.38 X_8$ (+.10)** | .56 | 16.82 |
| Y_1 | $= -1199.89 + 2155.77 X_9$ (2.67)* | .35 | 7.11 |
| Y_1 | $= -15753.13 + 6550.9 X_{10}$ (4.74)** | .63 | 22.50 |
| Y_1 | $= -38206.76 + 2025.13 X_{11}$ (2.94)** | .40 | 8.63 |
| Y_1 | $= 9885 + 8107.11 X_6 + 5612.43 X_{12}$ (3.60)** (.81) | .57 | 7.29 |
| Y_1 | $= 18194.04 + 2288.19 X_7 + 390.3 X_{13}$ (2.75)** (.18) | .39 | 3.52 |

Table-3.B

Determinants of Lar . Scale Manufa turing
(1977-78)

| Dependent Variable | Independent Variable | R ² | F |
|--------------------|---|----------------|-------|
| Y_2 | $= -16185.04 + 2862.7 X_5$ (2.75)** | .37 | 7.57 |
| Y_2 | $= 11379.1 + 6948.61 X_6$ (4.42)** | .60 | 19.57 |
| Y_2 | $= 18841.56 + 1858.18 X_7$ (3.19)** | .44 | 10.15 |
| Y_2 | $= -2953.48 + 6246.40 X_8$ (4.49)** | .61 | 20.14 |
| Y_2 | $= -8951.42 + 1753.56 X_9$ (2.88)** | .39 | 8.28 |
| Y_2 | $= -18145.89 + 5120.40 X_{10}$ (4.85)** | .64 | 23.51 |
| Y_2 | $= -32783.92 + 1520.9 X_{11}$ (2.81)** | .38 | 7.88 |
| Y_2 | $= 2383.87 + 6588.05 X_6 + 3592.93 X_{12}$ (4.07)** (7.08)** | .62 | 8.97 |
| Y_2 | $= 8319.94 + 1871.58 X_7 + 181.54 X_{13}$ (3.02)** (.11) | .44 | 4.32 |

Table-3.C

Determinants of Per Capita Manufacturing
('77-78)

| Dependent Variable | Independent Variable | R ² | F |
|--------------------|---|----------------|-------|
| Y_3 | $= -2.75 + 7.83 X_5$ (3.93)** | .54 | 15.51 |
| Y_3 | $= 97.04 + 14.22 X_6$ (3.58)** | .50 | 12.85 |
| Y_3 | $= 100.79 + 3.55 X_7$ (2.45)* | .32 | 6.01 |
| Y_3 | $= 52.38 + 14.71 X_8$ (5.09)** | .67 | 25.89 |
| Y_3 | $= 46.72 + 3.86 X_9$ (2.78)** | .37 | 7.74 |
| Y_3 | $= 18.97 + 11.87 X_{10}$ (5.30)** | .68 | 28.11 |
| Y_3 | $= 14.86 + 2.97 X_{11}$ (2.26)* | .28 | 5.10 |
| Y_3 | $= 17.26 + 11.90 X_6 + 31.87 X_{12}$ (3.96)** (3.43)** | .75 | 16.5 |
| Y_3 | $= 43.07 + 3.86 X_7 + 4.16 X_{13}$ (2.63)* (1.07) | .38 | 3.37 |

Table-3.D

Determinants of Per Capita Large Scale
Manufacturing (1977-78)

| Dependent Variable | Independent Variable | R ² | F |
|--|----------------------|----------------|-------|
| $Y_4 = 3.35 + 5.34 X_5$ (3.18)** | | .44 | 10.09 |
| $Y_4 = 63.32 + 11.28 X_6$ (3.91)** | | .54 | 15.30 |
| $Y_4 = 65.21 + 2.87 X_7$ (2.69)** | | .36 | 7.24 |
| $Y_4 = 29.35 + 11.15 X_8$ (4.73)** | | .63 | 22.42 |
| $Y_4 = 25.89 + 2.90 X_9$ (2.64)* | | .35 | 6.95 |
| $Y_4 = 4.85 + 8.93 X_{10}$ (4.82)** | | .64 | 23.19 |
| $Y_4 = 10.73 + 2.11 X_{11}$ (2.06)* | | .25 | 4.26 |
| $Y_4 = 19.35 + 10.38 X_6 + 15.96 X_{12}$ (3.75)** (1.87)* | | .64 | 9.78 |
| $Y_4 = 43.17 + 3.03 X_7 + 1.31 X_{13}$ (2.64)* (.43) | | .37 | 3.23 |

NOTES

1. D.T. Lakdawala, Y.K. Alagh and Atul Sarma, Regional Variation in Industrial Development, Bombay: Popular Prakashan, 1974.
2. Ibid.
3. Y.K. Alagh et.al., "Indian Industrialization: Regional Structure and Planning Issues," Business Standard, Annual Issue, 1983.
4. A. Uday Sekhar, "Trends in Inter-State Disparities in Industrial Development in India, 1961 to 1975," Indian Economic Journal, October-December, 1982. Also, K.R.G. Nair, Regional Experience in a Developing Economy, New Delhi, Wiley Eastern Ltd., 1982.
5. K.R.G. Nair, op.cit., p.60.
6. Ibid., and D.U. Sastry, "Inter-State Variations in Industry in India 1951-61: A Tentative Explanation," Indian Journal of Regional Science, 1970.
7. Ibid.
8. V.M. Dandekar and N. Rath, Poverty in India, Bombay, Indian School of Political Economy, 1971.
9. N.V. Sovani, Urbanization in India, Bombay, Asia Publishing House, 1975, p.82.
10. It is interesting to note that even the analysis based on the latest census reaches somewhat similar conclusions. It is observed that, "... the overall settlement pattern continues to be stable and well distributed". Rakesh Mohan, The Morphology of Urbanization in India: Some Results from the 1981 Census, Seminar on Urbanization and Planned Economic Development - Present Scenario and Future Perspectives, New Delhi, Jawaharlal Nehru University, Centre for the Study of Regional Development, September 1982.
11. Sovani, op.cit.
12. Rakesh Mohan, op.cit.

13. For some what elaborate discussion see, S.P. Kashyap, Role of Large Cities in Development - A Preliminary Survey of Literature and a Case Study, Seminar on Urbanization and Planned Economic Development - Present Scenario and Future Perspectives, op.cit.
14. For instance, R.L. Sanghvi, Rôle of Industrial Estates in the Industrial Development of Gujarat, Ph.D. Thesis, Gujarat University, 1977, shows that most of rural industrial estates proved to be non-starters. It was seen that even after seven years of incorporation of an industrial estate near Umbergaon, only about 16 per cent of the total disposable sheds could be allotted. Conclusions of another Ph.D. thesis are not different. D.C. Srivastava's work (An Evaluation of Industrial Policy for the Development of Backward Regions in India: A Case Study of Gujarat, Thesis approved by the Sardar Patel University, 1982, brings out that vigorous policy of backward area development did not affect the relative ranks of the districts. Concessions and incentives mainly helped only those districts that were near to the big industrial cities. Even for rural industries: "Proximity to road connection and urban centres seem most important determinants of the state of industrial units in the village." T.S. Papola and V.N. Mishra, "Some Aspects of Rural Industrialization," Economic and Political Weekly, Special Number, 1980, p.1745.
15. See, S.P. Kashyap, R.S. Tiwari and D.R. Veena, Facets of an Urban Economy: An Economic Base Study of Ahmedabad. Sardar Patel Institute of Economic and Social Research, Ahmedabad, 1980 (mimeo).
16. As quoted in Sovani, op.cit.
17. Ibid.
18. For instance, Ahmedabad houses 7 per cent of Gujarat's population and contributes 16 per cent of State's income. The city dominates the industrial scene of the State as it contributes about 30 per cent of income from the industry. (S.P. Kashyap et.al., op.cit.) This phenomenon is even more vividly seen in the case of Bombay. L.K. Deshpande notes: "Bombay

dominates Maharashtra's economy quite disproportionately to its share in State's population. While only 12 per cent of State's population of 50 million live in Bombay, almost 36% of the workers outside agriculture were enumerated in the city. It accounts for nearly half of the State's workforce in registered and unregistered factories, 42% of that of transport, storage and communication, 40% of that in Trade and commerce and 27% of the service workers in the State in 1971." (The Bombay Labour Market, University of Bombay, 1970, Mimeo.

19. "On the Urban Agglomeration and Economic Efficiency," Economic Development and Cultural Change, 1973, pp.309-24.
20. "Are Their Returns to Scale in City Size," Review of Economics and Statistics, 1976, pp.339-350.
21. "The Productivity of Cities," Quarterly Journal of Economics, 1975, pp.393-413.
22. City Size and National Spatial Strategies in Developing Countries, World Bank Staff Working Paper No. 252, Washington, World Bank, 1977.
23. April 1978 and September 1981 issues.
24. Government of India, Central Statistical Organization, Annual Survey of Industries. 1961, 1970, 1977-78, (Volume 1)
25. Census of India, 1961, 1971 and 1981. Data on Population of Various cities was obtained from Paper I of 1961, Paper I of 1972 and Paper I of 1981. The data on share of lakh plus cities for years 1961, 1971 and 1981 was also obtained from paper I of 1981.
26. The other equations which gave R^2 very near to the one given by the above equation were -

$$Y_2 = \hat{X}_1 + \hat{\beta} X_6$$

and

$$Y_2 = \hat{Z}_1 + \hat{\beta} X_{10}$$

An Analysis of Industrial Linkages in States
of the Indian Union

P. Venkatramaiyah
A. R. Kulkarni
Smt. L. Argade

Gokhale Institute of Politics
& Economics Pune 411004

In the economics of development the degree and the nature of interdependence of the different sectors of the economy have come to play an important role. Input-output Tables bring out explicitly how one sector of the economy is related with the others and input-output analysis shows the role of the inter-sectoral relations on the determination of the gross output levels. While planning the output levels to avoid bottlenecks in the economy was the initial motivation for the development of the input-output economics, Hirschman¹ used the intersectoral relations in formulating a development strategy by identifying the key sectors of the economy based on linkages between different sectors. In Section I of this paper we discuss the concept of linkages and their role in regional planning. Section II deals with the nature of the existing data base for the computation of linkages for different regions. In Section III we present an analysis of the linkages for different States

¹Hirschman, A.O., 'The Strategy of Economic Development', New Haven Yale University Press, 1958.

of the Indian Union.

1.1 Concept of Linkages

1.1.1 Direct Linkages

A production sector is linked with the other production sectors of the economy in two ways. The production of a commodity requires inputs from other sectors and is linked with those sectors which supply inputs to the given sector. This sector's output is also utilised as input by other sectors and in that sense it is linked with those sectors which use the output of this sector. To quantify these linkages the transactions that take place between different producing sectors are needed. Precisely this is the case of the input-output tables. Let X_{ij} denote the i th sectors output consumed for production of X_j units of the j th sector's output.

Backward Linkage: Backward linkage is defined as $U_j = \sum_i X_{ij} / X_j$. U_j shows the extent to which a unit of sector j 's output is dependent on the other sectors. This is called backward because U_j shows the (per unit) input that should become available prior to the production of a unit of j . Natural resource based sectors have small backward linkages. Manufacturing sectors have high backward linkages. If an industry with high backward linkage is encouraged this would lead to the growth of input industries as the demand for them now increases—a case of demand creating supply.

Forward Linkages: Forward linkage is defined as $W_i = \sum_j X_{ij} / X_i$. $100 W_i$ shows the percentage of output that is used

by other production sectors of the economy. This is called forward linkage because this shows the extent to which it can induce the production of the other sectors. Goods which are intermediate in nature and do not satisfy the needs of the consumers directly like fertilisers and electricity have high forward linkages and those goods which are largely demanded by consumers directly like foodgrains or textiles have low forward linkages. The connection of forward linkage with the development process is that if production of a commodity with a high forward linkage is encouraged it would induce the development of other industries in which it is used as an input as easy input availability gives impetus to their growth. This is a case of supply creating demand.

It is necessary to point out one major limitation of the forward linkage as defined above. The inter sectoral relations that are depicted in the usual (static) input-output systems pertain to only current transactions and exclude capital expenditures. Capital expenditures become part of the final demand vector. Thus the forward linkage of machinery sectors turns out to be low showing low inducement effects which is contrary to the reality.

1.1.2 Indirect Linkages

The above definitions of forward and backward linkages are based only on the first layer intersectoral relationships. An industry which has high backward linkages does not merely produce demand for its inputs, but these inputs in turn require further inputs and the process goes on. The elements of the

Leontief Inverse capture the sum total effect of the infinite layers of production process. The direct and indirect linkage effect is defined in terms of the elements of Leontief Inverse as

$$TL_j = \sum_{e=1}^n a_{ej}^* \quad \text{where } a_{ej}^* = (I - A)^{-1}$$

It may be noted that "the direct plus indirect linkage effect as defined above captures not only the backward effects but also something in the way of forward effects as well. It is wellknown that the inverse of the Leontief matrix can be approximated by

$$(I - A)^{-1} = I + A + A^2 + A^3 + \dots$$

The multiplication of A matrices to obtain A^2 etc. in the above involves forward linkage to the extent that going backward ad infinitum in a closed system also captures forward effects".² Secondly, the above linkage effect is expressed in terms of per unit output and the sectoral composition of total production has not been taken account of by appropriate weighting diagram. The simplest method of weighting according to sectors share in total

²Pan A. Yotopoulos and Jeffrey B. Nugent, "A balanced growth version of the Linkage hypothesis : A test", The Quarterly Journal of Economics, Harvard University Cambridge (Mass), Vol. LXXXVII, No.2, May 1973, pp. 157-171.

output is due to Rasmussen,³ who defines "power of dispersion" index as

$$Y_j = \frac{\frac{1}{n} \sum_{i=1}^n a_{ij}^*}{\frac{1}{n^2} \sum_i \sum_j a_{ij}^*} = \frac{n \sum_{i=1}^n a_{ij}^*}{\sum_i^n \sum_j a_{ij}^*}$$

This index consists of "normalising" the direct and indirect linkage ΠL_j with respect to the number of sectors (n), the column sum of interdependence coefficients ($\sum_i a_{ij}^*$) and the average of all interdependence coefficients ($\sum_j a_{ij}^*$). In other words this index gives the ratio of the average direct and indirect input dependence of the specific sector j on every other sector i to the average direct and indirect input dependence of any other sector on any other sector in the total economy. The measure Y_j is convenient in interpreting the linkage coefficients as it measures the effects of increased output of one sector relative to those of all sectors. If the value of Y_j for a sector is smaller than unity, then the sector transmits only weak output inducements for the economy. On the other hand if the value is greater than unity, then the sector transmits above average inducements to other sectors.

The above direct and indirect linkage effect has been termed in literature as "direct and indirect backward linkage" effect and analogously "direct and indirect forward linkage" effect has been defined as the row sum of interdependence co-

³P.N. Rasmussen, Studies in Intersectoral Relations, North-Holland Publishing Co., Amsterdam, 1956, pp. 133-135.

efficients or the elements of Leontief inverse of input-output coefficients matrix i.e. ($\sum_j^n a_{ij}^*$) and further its normalised version has also been defined by Rasmussen termed as "index of the sensitivity of dispersion" or "forward power of dispersion".⁴ However, defining direct and indirect forward linkage effect using the elements of A* on the analogy of backward linkage, in our view, is logically unsound and is not really meaningful though a number of researchers have worked with this measure.⁵ While the inverse elements of a given column used in the backward linkage concept are additive, the elements of a given row are not so. The greater the number of sectors into which an economy is divided, the greater will be the sum of inverse coefficient element in a given row, while the column sum is independent of the number of sectors. Even dividing the sum of row elements by the number of sectors is not of any help unless it is assumed that all the sectors are equally important, an assumption which is far from reality. Thus to devise direct and indirect forward linkages on the analogy of backward linkages is not logically correct. Rasmussen who devised these simple measures was careful in interpreting the measure and clearly pointed out the limitations and suggested a weighted

⁴ Vide for example Wuu-Long Lin and P.A. Yotopoulos, "The Linkage Analysis in Development Planning", The Agricultural Development Council inc, Curriculum and Teaching Materials, No. 45, April 1975.

⁵ Vide for example V.R. Panchamukhi, "Linkage in Industrialisation : A Study of Selected Developing Countries," Journal of Development Planning, United Nations, New York.

measure for working out the forward linkages. Nonetheless, in the literature the sum of the inverse elements of a row as the direct and indirect forward linkage is used by many workers because of its simplicity though it lacks rational basis.

The correct way, in our view, to evaluate the forward linkages is to use the direct flows of the transaction matrix and not the coefficients of A or A^* matrix. If one desires to work with coefficients rather than transactions, a coefficient matrix constructed such that the row sum of coefficients, including final demands, is unity needs to be used. It must be pointed out that such a "row coefficient matrix", however, is not useful for evaluating the direct and indirect backward linkages, just as the familiar A coefficient matrix cannot be used for evaluating direct and indirect forward linkages. We have therefore not considered the forward linkage measure based on inverse elements of the familiar A matrix.

II Data Base

2.1 Availability of Input-output Tables

To quantify and analyse the linkages of different states it is necessary to have an input-output table for each of the States of the Indian Economy. If the objective is to assess how the linkages have changed overtime, I-O tables for two time periods are necessary. No set of regional tables on a comparable basis are available for two time periods. Hence no analysis of the changes in linkages could be attempted.

For many of the States of the Indian Union input-output tables are constructed for one year or the other by research workers acquainted with the particular State economy. While these are useful for analysing the regional economy, because of the differences in methodology, sectoral classification and reference period these tables are of limited use in comparing linkage structures of the States. For the year 1965 Gokhale Institute of Politics and Economics constructed regional input-output tables for each of the States and the Union Territories on a uniform comparable basis.⁶ These constitute the data base on which the linkages were calculated and analysed in the next section. We outline below some of the salient features and limitations of these tables.

2.2 Sectoral Classification

The regional economies have been classified into 86 sectors of which 11 belong to agriculture and allied activities, 9 pertain to mining, 60 to manufacturing and the remaining 6 are accounted by the other sectors. The classification is largely based on the Indian Standard Industrial Classification (SIC) upto 3 digit level of classification with some minor modifications. A description of these sectors is given in Appendix 1. In case of Agriculture and Mining the entire output is covered. The input vectors of Manufacturing are based only on large scale manufacturing based on Annual Survey of

⁶P. Venkatramaiah, A.R. Kulkarni and L. Argade, Regional Input-Output Matrices, India 1965, Gokhale Institute of Politics and Economics, Pune, 1980.

Industries Census Reports. The requirements of the small scale and cottage sectors of the Manufacturing division do not get represented in the input coefficients. Because of the exclusion of this, the linkages based on these tables need to be interpreted cautiously. For example, the oilseeds sector which by its nature must have high forward linkages as most of it gets consumed as an input in the oil crushing industry, the forward linkage of oil seeds calculated from these I-O tables is not likely to be high as most of the oil crushing units are in the small scale and cottage sectors of the economy. The input usage of oilseeds in large scale division is likely to be small and as such the computations are likely to show only small forward linkage. The coverage of the other sectors, construction, transport, etc. has many more limitations.⁷

2.3 Reference Year

The input-output coefficient matrices on which the linkages were calculated refer to the year 1965. Using more than 15 year old data to calculate the linkages may give an impression that this is an exercise in economic history. The large delays in processing and publishing the data, regional input-output tables, invariably results in the usage of such vintage tables. Even at the national level the latest input-output table that is just published pertains to the year 1973-74.

⁷ Op.cit., pp. 110-116.

2.4 Prices

The linkages are based on the coefficients evaluated at producers prices. As is well known, the coefficients at producers prices are more stable and reflect the technology much better than the coefficients at purchasers prices.

2.5 Inter-regional Flows

It has not become possible to distinguish the domestic inputs from the inputs that are imported into the region. In other words if inter-regional flows also had been available in addition to the inter-sectoral flows it would have become possible to bring out the dimension and the nature of inter-regional linkages in addition to the inter-sectoral linkages. Unfortunately such data are not available and the analysis had to be confined to the nature of inter-sectoral linkages in different states.

III

Analysis of Linkages

3. The Structure of Linkages in the States

3.1 The Magnitude of Linkages

In Section I the backward and the forward linkages for a sector are defined. For the economy of a region as a whole the magnitude of the forward and backward linkage would be the same.⁸ The magnitude of this linkage (inter-industry use as proportion of total output) shows the degree of inter-dependence of the

⁸ In actual calculation there would be slight difference between the two as total production in a region may differ from the total availability (supply).

economy. The process of development, simply stated, lies in further processing of the primary products, so that their use value gets enhanced to the final consumer. A commodity, which satisfies a given type of wants of a consumer, goes through an increasing number of processes as the economy develops. The relationship between the changing shares of primary, secondary and tertiary sectors with economic development is well known. As the secondary sector's share increases the proportion of commodities that go into inter-industry is expected to increase. Thus the inter-industry use of commodities is expected to be high in the states which are relatively advanced. The table below presents the proportion of inter-industry use of production for different States in India calculated on the basis of the input-output tables mentioned in Section II.

Table 1: The Aggregate Linkage (Percentage of Inter-Industry Use to Gross Production) in Different States

| State | Linkage | State | Linkage |
|----------------|---------|-----------------|---------|
| Maharashtra | 48 | Bihar | 33 |
| Gujarat | 45 | Andhra Pradesh | 32 |
| West Bengal | 44 | Karnataka | 31 |
| Tamil Nadu | 40 | Uttar Pradesh | 31 |
| Madhya Pradesh | 40 | Orissa | 29 |
| Rajasthan | 38 | Kerala | 22 |
| Punjab | 36 | Jammu & Kashmir | 21 |
| | | INDIA | 37 |

The States have been listed according to the strength of their linkage in the above table. It is clear that those which have higher linkage are relatively more developed than those having lower linkages. It looks that there is a near one to one

correspondence between the magnitude of the linkage and the level of development. The coefficient of variation in the linkages works out to 35 per cent in 1965. If the regional inequalities have decreased since then, one expects the coefficient of variation in the linkages to decrease.

3.2 Direct and Total Backward Linkages

3.2.1 Magnitudes of Direct and Total Linkages

The direct linkage tells only a part of the story and to assess the interconnections at different layers of production the total linkages as defined in Section II need to be calculated. The 85 sectors of each region's economy is aggregated into 4 broad divisions viz. Agriculture, Division 2 of manufacturing (Agro-based industries), Division 3 of Manufacturing and the rest of the economy. For each State the Direct backward linkage and the total backward linkage for each of these broad divisions are presented in Appendix 2.1.

For agriculture at the all-India level, the direct linkage is 0.23 while the total linkage is 1.38. Kerala has the lowest linkages both direct and total (0.07 and 1.09) while Rajasthan and Madhya Pradesh as well, have the highest linkages (0.34 and 1.57). For Division 2 the highest direct linkage is for Assam (0.78), followed by Punjab (0.77) but the highest total linkages are for Gujarat (2.62) followed by West Bengal (2.49). The lowest linkages are observed in Jammu and Kashmir (0.56 and 2.03). The all-India direct and total linkages are 0.71 and 2.34 respectively. In case of Division 3 Jammu and

Kashmir has the highest direct linkage (0.68) and Orissa has the lowest (0.48). The total linkage is highest in Gujarat (2.45) and lowest in Orissa (1.74). At the all-India level the direct and total linkages are 0.61 and 2.21. For the other sectors Gujarat has the highest direct and total linkages while Orissa has the lowest.

3.22 Deviations in the Ranks Based on Direct and Total Linkages

The rankings of the States according to direct and total linkages for each of the divisions is presented in Table 2. The State having the highest linkage is ranked 1.

In case of Agriculture and 'other sectors' there is not much difference in the rankings on the basis of direct and total linkages. The rank correlation coefficient in case of Agriculture is 0.9946 and is 0.9892 for other sectors. There exist considerable deviations in the ranks for direct and total linkages for the manufacturing divisions 2 and 3. The rank correlation coefficients are 0.9069 and 0.9368 for divisions 2 and 3 respectively. Assam which has the highest direct linkage (0.78) for manufacturing Division 2 has one of the lowest total linkages (2.04) which is only marginally better than that of Jammu and Kashmir (2.03) which has the lowest direct linkage (0.56).

The States which have improved their ranking on total linkage basis compared to that of direct linkage, both in Divisions 2 and 3 of manufacturing are Gujarat, Tamil Nadu, Maharashtra, Rajasthan and West Bengal (and also All India).

All these are advanced States. Karnataka and Uttar Pradesh have improved their ranking in one of the divisions of manufacturing while have remained at the same rank in the other division of manufacturing. Uttar Pradesh which is one of the backward States shows a strong linkage structure similar to that of advanced States. If this data can be relied on it reveals that the underdevelopment of Uttar Pradesh is more because of the level of industrialisation and it has a structure which is growth oriented. The States where the total linkage rank is no better than that of the direct linkage rank Andhra Pradesh, Assam, Bihar, Jammu and Kashmir and Orissa which are all backward.

In Appendix 2.2 a table is presented showing the indirect input that would be demanded for Rs.100 worth of direct input for each of the States for the four major divisions. The linkage structure is such that the advanced States use more indirect input for a given quantum of direct input and the conclusions are similar to the one based on linkage deviations.

3.3 Forward Linkages

Forward linkage of a sector is defined as the proportion of inter-industry consumption of that sector's output. The measure of the forward linkage of sectors can be utilised in the initial identification of the sectors that have a potentiality to grow in a given region. The sectors which have more than 100 per cent inter-industry consumption of that sector's (regional) output show that there is demand for that sector's

Table 2 : Ranks of States according to Strength of Backward Linkages.

| | Agriculture | | Large Scale Manufacturing | | Large Scale Manufacturing | | Other Sectors | |
|--------------------|-------------|--------|---------------------------|--------|---------------------------|--------|---------------|----|
| | | | D | I | D | I | D | I |
| | | | Division 2 | | Division 3 | | D | I |
| Andhra Pradesh | 10 | 9 | 6 | 10 | 5 | 9 | 9 | 9 |
| Assam | 15 | 15 | 1 | 15 | 3 | 14 | 15 | 15 |
| Bihar | 12 | 11 | 10 | 12 | 11 | 11 | 2 | 4 |
| Gujarat | 4 | 4 | 4 | 1 | 9 | 3 | 1 | 1 |
| Jammu and Kashmir | 13 | 13 | 16 | 16 | 1 | 8 | 5 | 8 |
| Karnataka | 11 | 10 | 15 | 11 | 15 | 15 | 11 | 12 |
| Kerala | 16 | 16 | 12 | 13 | 13 | 12 | 13 | 11 |
| Madhya Pradesh | 1 | 2 | 3 | 4 | 14 | 13 | 14 | 14 |
| Maharashtra | 3 | 3 | 14 | 9 | 7 | 5 | 6 | 6 |
| Orissa | 9 | 12 | 9 | 14 | 16 | 16 | 16 | 16 |
| Punjab and Haryana | 5 | 5 | 2 | 5 | 2 | 1 | 4 | 2 |
| Rajasthan | 2 | 1 | 5 | 3 | 12 | 10 | 12 | 10 |
| Tamil Nadu | 8 | 6 | 13 | 6 | 6 | 4 | 8 | 5 |
| Uttar Pradesh | 6 | 8 | 8 | 8 | 4 | 2 | 3 | 3 |
| West Bengal | 14 | 14 | 7 | 2 | 8 | 7 | 10 | 13 |
| All India | 7 | 7 | 11 | 7 | 10 | 6 | 7 | 7 |
| Rank Correlation | 0.9946 | 0.9069 | | 0.9368 | | 0.9892 | | |

D = Indicates Direct Linkage

I = Total Linkage

output in the region and hence it faces no marketing problem. For each of the States in India the sectors whose regional output is not even sufficient to meet the inter-industry demand is shown in the Appendix Table 3.1. The existence of a market for a commodity by itself does not ensure the success of the producing units. In a given region it may not just be possible to produce some commodities like coal and crude oil which are natural resource based. In case of some other commodities it may not be possible to produce them in the given region at an economic cost.

In column 1 of the Table 3.1 of the said Appendix the sectors for whose output not only demand exists but also the cost per unit is less than the all-India average are identified and listed for each State. *Prima facie* these industries have the potentialities to develop. It must be noted that there is an implicit assumption that the product-mix of each sector across the regions is the same. If the product-mix is very different our conclusions based on linkages may be misleading. Using all-India average to determine the cost effectiveness may also be objected on the ground that it is not the all-India average that is relevant but the average of the least cost regions that should be considered. In spite of these limitations, this criterion (more than 100 per cent inter-industry demand and less than all-India cost) at least gives a preliminary idea of the sectors that have the potentiality to grow.

3.4 Cheney-Watanabe Categories Based on Backward and Forward Linkages

Cheney and Watanabe developed a method for inter-country comparisons of the structure of production using the forward and backward linkages.⁹ In this method the sectors of the economy are classified into 4 categories on the basis of the U-W ratios. U_j shows the strength of the backward linkage and W_i the strength of the forward linkage for a sector. The categorisation of sectors is given below.

Cheney Watanabe classification of sectors

| <u>By output use</u> <u>By Input type</u> | Final Low W | Intermediate High W |
|--|---|---|
| Manufacturing | III Final manufacture | II Intermediate manufacture |
| High U | High Backward & Low Forward Linkage | High Backward & High Forward Linkage |
| Primary Production | IV Final Primary Production | I Intermediate Primary Production |
| Low U | Low Backward & Low Forward Linkage | Low Backward & High Forward Linkage |

⁹H.B. Chenery and T. Watanabe, "International Comparisons of the Structure of Production," *Econometrica*, Vol.26, No.4, 1958, p. 487.

At the all-India level the share of production of categories I, II, III and IV are 2%, 11%, 37% and 50% respectively. It is to be expected that the poorer regions have larger share of output falling in category IV and smaller share of it in categories III and II. The contrary should be the case with richer regions. The share of category IV in Maharashtra is 36% as against 68% in case of U.P. The share of categories III and II is 27% and 5% respectively for U.P. while it is 46% and 18% for Maharashtra.

The more interesting aspect to examine is how the classification of a given sector changes from one region to another. It might be supposed that it is the nature of the commodity (sector) that determines the category to which it belongs rather than the economy in which it is produced. For example, Fertiliser is by its nature an intermediate commodity and requires manufactured inputs for its production. Thus irrespective of the economy in which it is produced it should belong to category II (intermediate manufactures). This may not be necessarily true. If the region either because of its comparative advantage or due to its backwardness in agriculture sells a large part of its fertiliser output outside the region it may be classified as sector in category III. Further depending on the level of development the same commodity (sector) may be classified in different categories. For e.g. wheat flour which belongs to Final manufacture (III) in one economy may belong to Intermediate manufactures II (going as an input into bread making) in another economy.

Each of the 3 digit sectors are classified into the IV categories for a given state (depending on the linkage strength of that State) and in Table 3 we have abstracted for selected states how the sectors in a State have deviated from the all-India classificatory scheme for illustration. The numbers shown under row I, column II for Maharashtra indicate that sectors which are classified under category I in Maharashtra while they are classified under category II at the All-India level. The detailed table covering all the States is provided in the appendix.

Both in the case of developed and backward States we observe heavy concentration of sectors in row III and column II. Many sectors which are classified as Intermediate manufactures at the all-India level get classified as final manufactures at the State level. This happens both in the case of developed and backward States though for different reasons. The forward linkage looks to be low for advanced states because of their high output and in the case of backward states the forward linkage is low because of their low inter-industry demand (for many sectors). In the case of advanced states deviations also occur from category III (low W high U) at the all-India level to category IV (low W low U) at the state level indicating the cost effectiveness of these sectors. (This is only an indication because it is possible that low U of the state may be greater than high U of all-India). In case of backward states deviations in quite a few sectors occur from all-India

Table 3 : Sectors deviating from All India Chenery-watanabe Classification

| State | All India | I High w, Low u | II High w, High U | III Low w, High u | IV Low w, Low u |
|-------------|-----------|-----------------------|---|--|-----------------------|
| Maharashtra | I | x | 211, 331, 333 | x | x |
| | II | x | x | 334, 341 | x |
| | III | x | 300, 313, 321 350 | x | x |
| | IV | 120 | 339, 511 | 220, 231, 260, 280, 381, 382, 384, 386, 391, 393, 394 | x |
| West Bengal | I | x | 331 | x | 021, 090 |
| | II | x | x | 207 | x |
| | III | x | 209, 233, 300 329, 332, 333, 350, 389 | x | x |
| | IV | x | x | 070, 220, 381 386, 393, 395 | x |
| Orissa | I | x | x | x | x |
| | II | x | x | 319, 382 | x |
| | III | x | 271, 313, 331, 332, 333, 340 | x | x |
| | IV | x | x | x | x |
| Bihar | I | x | x | 399 | 041 |
| | II | 150 | x | 205, 231, 291, 319, 282 | |
| | III | 043 | 211, 259, 310 329, 340 | x | 710, 720 |
| | IV | 110 | x | 160, 381 | x |

category III to category II at the state level showing that the output level of these industries is low compared to their inter-industry use. Thus by examining these deviations it is possible to identify those industries which have the potentiality to develop.

3.5 Comparison of State Linkages at Sectoral Level

The U-W analysis in 3.4 is based on the strength of linkages at the regional level. On the basis of comparison of a region's sectoral linkage with that of all-India sectors in the economy can be categorised.

Let U^S , U^I , W^S , and W^I represent the backward linkage for the state, backward linkage for all-India, forward linkage for the state and forward linkage for the country, of a particular sector. Based on these linkages the sectors in a State can be categorised into the following four categories.

| | | |
|-----|-------------|-----------------|
| I | $U^S > U^I$ | and $W^S > W^I$ |
| II | $U^S > U^I$ | and $W^S < W^I$ |
| III | $U^S < U^I$ | and $W^S < W^I$ |
| IV | $U^S < U^I$ | and $W^S > W^I$ |

Sectors in category I have higher cost at the State level and relatively larger part of their output is used for inter-industry consumption which means that their output level is low. As the cost is higher in the state it is reasonable that its output level should be lower. Sectors in category II have higher costs in the States and also higher levels of output (higher compared to its industrial structure). These sectors do

not deserve to be encouraged. Sectors in category III are those where the State has an advantage in the cost but its forward linkage is low. This indicates that those industries which use category III sectors as inputs (and also have a cost advantage) need to be developed in the State. Category IV consists of sectors showing the ideal combination of low costs and larger output. For each of the States the sectors classified into these four categories have been presented in Appendix tables 3.2(a) to 3.2(d).

4.0 Conclusion

The following conclusions emerge from our analysis. The proportion of inter-industry consumption (aggregate linkage) is higher in more developed states. The changes in the coefficient of variation of aggregate linkage of the states indicates whether there is a decline in the regional inequalities. More developed States use more indirect input for a given quantum of direct input. The more developed States show a better ranking on the basis of the total linkage compared to the ranking on direct linkage basis. The coefficient of variation for the backward linkages of sectors is lower for a more developed region compared to a less developed region. So also is the case with forward linkages. Analysis of deviations of regional classification of sectors from that of national classification enables the identification of sectors that have the potentiality to grow in a region.

Our analysis is confined to the linkage structure of regions at a given point of time and as to how the linkages

have changed overtime have not been analysed as two point data are not available.

An analysis based on quantification of linkages and their comparison with some norm like that of all-India has some objective empirical base. However, the analysis has many limitations especially in the context of regions within a State. Questions like the commodity composition of output of different states, the necessity of specialisation of regions, the varying compositions of the organised and unorganised sectors of the economy which affect the data base, the historical development of the region etc. all have to be carefully considered. The linkage analysis however, "is something to be added, to (economist-planner's) criteria-box. But excessive reliance should obviously not be placed on these rankings, based as they are on a mental experiment subject to numerous qualifications."¹⁰

¹⁰Hirschman, op.cit., p.108.

Appendix 1 : Sector Code List*

| Sector No. | Sector Code | Title |
|------------|-------------|---|
| 1 | 011 | Food grains |
| 2 | 021 | Oil Seeds |
| 3 | 031 | Fibres |
| 4 | 041 | Sugarcane |
| 5 | 042 | Tobacco |
| 6 | 043 | Tea Plantation |
| 7 | 044 | Coffee Plantation |
| 8 | 069 | Other Agriculture |
| 9 | 070 | Animal Husbandry |
| 10 | 080 | Fisheries |
| 11 | 090 | Forestry |
| 12 | 110 | Coal Mining |
| 13 | 120 | Ferrous Mining |
| 14 | 130 | Crude Petroleum |
| 15 | 140 | Stone and Clay |
| 16 | 150 | Bauxite Mining |
| 17 | 160 | Other Metal Mining |
| 18 | 170 | Chemical and Fertilizer Mining |
| 19 | 180 | Other Nonmetallic Mining |
| 20 | 190 | Water |
| 21 | 202 | Dairy Products |
| 22 | 203 | Canning of Fruits and Vegetables |
| 23 | 204 | Canning of Seafoods |
| 24 | 205 | Grain Mill Products |
| 25 | 206 | Bakery Products |
| 26 | 207 | Sugar Manufacture |
| 27 | 208 | Sugar Confectionary |
| 28 | 209 | Miscellaneous Food |
| 29 | 211 | Spirits (Alcohol) |
| 30 | 212 | Wine |
| 31 | 213 | Breweries and Malt |
| 32 | 214 | Soft Drinks |
| 33 | 220 | Tobacco Products |
| 34 | 231 | Textiles, Spinning and Weaving etc. |
| 35 | 232 | Knitting Mills |
| 36 | 233 | Cordage and Ropes |
| 37 | 239 | Textiles n.e.c. |
| 38 | 241 | Footwear |
| 39 | 243 | Wearing Apparel |
| 40 | 251 | Saw Mills |
| 41 | 252 | Wooden and Cane Small Ware |
| 42 | 259 | Wood Manufacture n.e.c. |
| 43 | 260 | Furnitures and Fixtures |
| 44 | 271 | Pulp, Paper and Paper Boards |
| 45 | 280 | Printing and Publishing |
| 46 | 291 | Tanneries |
| 47 | 293 | Leather Products and Wearing Apparel n.e.c. |
| 48 | 300 | Rubber Products |

Contd./-

| Sector No. | Sector Code | Title |
|------------|-------------|---|
| 49 | 310 | Fertilizers |
| 50 | 311 | Basic Industrial Chemicals |
| 51 | 312 | Vegetable Oils |
| 52 | 313 | Paints and Vernishes etc. |
| 53 | 319 | Miscellaneous Chemicals |
| 54 | 321 | Petroleum Refineries |
| 55 | 329 | Petroleum Products |
| 56 | 331 | Structural Clay Products |
| 57 | 332 | Glass and Glass Products |
| 58 | 333 | Pottery and China Ware |
| 59 | 334 | Cement |
| 60 | 339 | Nonmetallic Mineral Products |
| 61 | 340 | Iron and Steel (Metal) |
| 62 | 341 | Iron and Steel Industries |
| 63 | 342 | Nonferrous Metal Industries |
| 64 | 350 | Metal Products except Machinery and Transport Equipment |
| 65 | 360 | Non-electrical Machinery |
| 66 | 361 | Machine Tools |
| 67 | 370 | Electrical Machinery |
| 68 | 381 | Ship Building |
| 69 | 382 | Rail.Road Equipment |
| 70 | 383 | Motor Vehicles |
| 71 | 384 | Motor Vehicle Repairs |
| 72 | 385 | Motor Cycles and Bicycles |
| 73 | 386 | Aircraft |
| 74 | 389 | Transport Equipment n.e.c. |
| 75 | 391 | Scientific Equipment |
| 76 | 392 | Photographic and Optical Goods |
| 77 | 393 | Watches and Clocks |
| 78 | 394 | Jewellery |
| 79 | 395 | Musical Instruments |
| 80 | 399 | Industries n.e.c. |
| 81 | 400 | Industries n.e.c. |
| 82 | 511 | Electricity |
| 83 | 600 | Industries Unspecified |
| 84 | 710 | Railway Transport |
| 85 | 720 | Road Transport |
| 86 | 790 | Trade and Excise etc. |

* P. Venkatramaiah et. al "Regional Input-Output Matrices, India, 1965, Gokhale Institute of Politics and Economics, Pune 1979.

Appendix 2.1 : Magnitudes of Direct and Total Linkages in States

| | Agriculture | Large Scale Manufacturing | | Other Sectors | |
|--------------------|-------------|---------------------------|------------|---------------|-------------------|
| | | Division 2 | Division 3 | | |
| Andhra Pradesh | .22 | 1.36 | .74 | 2.21 | .64 2.20 .43 1.83 |
| Assam | .14 | 1.20 | .78 | 2.04 | .66 1.96 .36 1.62 |
| Bihar | .21 | 1.32 | .71 | 2.19 | .61 2.16 .47 1.92 |
| Gujarat | .27 | 1.47 | .75 | 2.62 | .62 2.34 .48 1.99 |
| Jammua and Kashmir | .16 | 1.25 | .56 | 2.03 | .68 2.20 .45 1.85 |
| Karnataka | .21 | 1.32 | .69 | 2.21 | .52 1.94 .42 1.78 |
| Kerala | .07 | 1.09 | .71 | 2.12 | .60 2.09 .41 1.79 |
| Madhya Pradesh | .34 | 1.57 | .77 | 2.46 | .56 2.03 .41 1.75 |
| Maharashtra | .30 | 1.50 | .63 | 2.22 | .62 2.27 .44 1.86 |
| Orissa | .23 | 1.32 | .71 | 2.09 | .48 1.74 .32 1.50 |
| Punjab and Haryana | .27 | 1.45 | .77 | 2.45 | .67 2.45 .46 1.97 |
| Rajasthan | .34 | 1.57 | .75 | 2.49 | .60 2.18 .42 1.82 |
| Tamil Nadu | .23 | 1.39 | .70 | 2.37 | .64 2.31 .43 1.86 |
| Uttar Pradesh | .23 | 1.37 | .72 | 2.26 | .65 2.36 .47 1.95 |
| West Bengal | .14 | 1.21 | .72 | 2.49 | .62 2.20 .42 1.76 |
| All India | .23 | 1.38 | .71 | 2.34 | .61 2.21 .44 1.86 |

Note : Ist row indicates direct linkage & the 2nd row indicates Total linkage i.e. Direct + Indirect

Appendix 2.2 : Indirect Input Necessary for Rs. 100 Worth of Direct Input

| State | Agriculture and Mining | Large Scale | Large Scale | Other Indus- ties |
|-----------------------|------------------------------|----------------------------------|----------------------------------|-------------------------|
| | | Manufactur- ing Division 2 | Manufactur- ing Division 3 | |
| Andhra Pradesh | 164 | 163 | 186 | 191 |
| Assam | 192 | 134 | 147 | 172 |
| Bihar | 155 | 167 | 188 | 196 |
| Gujarat | 175 | 216 | 215 | 207 |
| Jammu and Kashmir | 152 | 183 | 177 | 190 |
| Karnataka | 152 | 176 | 132 | 134 |
| Kerala | 141 | 158 | 183 | 191 |
| Madhya Pradesh | 166 | 191 | 183 | 183 |
| Maharashtra | 165 | 192 | 202 | 195 |
| Orissa | 142 | 153 | 152 | 158 |
| Punjab and Haryana | 168 | 186 | 217 | 212 |
| Rajasthan | 249 | 197 | 197 | 195 |
| Tamil Nadu | 165 | 196 | 204 | 199 |
| Uttar Pradesh | 158 | 175 | 207 | 203 |
| West Bengal | 151 | 206 | 193 | 180 |
| All India | 161 | 188 | 197 | 194 |

Appendix 3.1 : Statewise Industries with Forward Linkages greater than 100%

| State | Industries with cost per unit less than all India cost | Industries with cost per unit more than all India cost |
|--------------------|--|--|
| Andhra Pradesh | 120, 170, 331, 333 | 180, 311, 319, 321, 332 340, 350, 382 |
| Assam | 331, 339, 341 | 205, 311, 340, 310 |
| Bihar | 140, 150, 170, 311, 350 | - |
| Gujarat | 170, 233, 300 | 140, 259, 331 340, 350 |
| Jammu and Kashmir | 331, 350 | 140, 209, 311 |
| Karnataka | 130, 285, 311, 312, 332, 350 | 313, 333, 339 |
| Kerala | 140, 233, 332 | 150, 170, 205, 340, 350, 382 |
| Madhya Pradesh | 300, 331, 333, 341, 350 | 170 |
| Maharashtra | 110, 140, 233, 340 | 333 |
| Orissa | 110, 319, 339 | 209, 350, 382 |
| Punjab and Haryana | 140, 170, 312, 319, 340 | 233, 291, 311, 313 |
| Rajasthan | 319, 340 | 332, 333 |
| Tamil Nadu | 110, 140, 205, 312, 350 | 331, 340 |
| Uttar Pradesh | 140, 170, 300, 312, 339 | 331, 333 |
| West Bengal | 140, 311, 312, 331 | 211 |

Appendix 3.2(a) : Sectors where Backward Linkage of State is lower than in All-India and Forward Linkage of State higher than in All-India.

| | |
|--------------------|---|
| Andhra Pradesh | 041, 042, 120, 205, 239, 280, 321, 331, 360, 383, 393, 399 (12 Sectors) |
| Assam | 043, 280, 319, 331, 339, 341, 360, 400 (8 Sectors) |
| Bihar | 070, 150, 170, 202, 241, 333, 342, 350, 350, 399 (10 Sectors) |
| Gujarat | 170, 207, 209, 233, 239, 241, 271, 293, 300, 310, 319, 321, 339, 342, 370, 382, (16 Sectors) |
| Jammu and Kashmir | 031, 231, 319, 331, 334, 339, 400 (7 Sectors) |
| Karnataka | 205, 239, 280, 300, 311, 312, 331, 332, 341, 350, 360, 370, 393, 399, (14 Sectors) |
| Kerala | 031, 041, 140, 150, 170, 207, 243, 332, 334, 339, 360, 511 (12 Sectors) |
| Madhya Pradesh | 069, 120, 150, 180, 241, 243, 300, 310, 331, 333, 341, 350, 370, 383 (14 Sectors) |
| Maharashtra | 170, 203, 207, 211, 220, 251, 271, 291, 329, 331, 332, 334, 341, 370, (14 Sectors) |
| Orissa | 319, 339, 342, 400 (4 Sectors) |
| Punjab and Haryana | 011, 031, 170, 207, 243, 260, 280, 293, 300, 312, 319, 342, 393 (13 Sectors) |
| Rajasthan | 209, 280, 319, 350, 383 (5 Sectors) |
| Tamil Nadu | 070, 110, 150, 202, 205, 241, 280, 312, 329, 341, 350, 361, 385, 392 (14 Sectors) |
| Uttar Pradesh | 140, 211, 231, 239, 251, 271, 300, 310, 312, 334, 339, 342, 393, 400 (14 Sectors) |
| West Bengal | 021, 043, 140, 220, 239, 259, 291, 311, 312, 331, 360, 393 (12 Sectors) |

Appendix 3.2(b) : Sectors where Backward Linkage of State is higher than All India but Forward Linkage in the State is lower than All India

| | |
|-----------------------|---|
| Andhra Pradesh | 031, 069, 080, 090, 110, 140, 203, 206, 207, 220 243, 252, 271, 291, 312, 339, 341, 389, 391, 394, 400, 511, 710, 720, (24 Sectors) |
| Assam | 041, 042, 140, 207, 239, 252, 260, 370, 511, 720, (10 Sectors) |
| Bihar | 042, 043, 069, 180, 206, 207, 211, 243, 259, 271, 280, 329, 331, 334, 339, 341, 370, 383, 385, 400, 710, 720, (22 Sectors) |
| Gujarat | 011, 041, 042, 202, 203, 220, 231, 243, 260, 333, 341, 384, 393, 400, 511, 720 (16 Sectors) |
| Jammua and Kashmir | 041, 211, 259, 291, 384, 720, (6 Sectors) |
| Karnataka | 031, 042, 044, 150, 160, 180, 203, 206, 207, 208, 209, 212, 213, 220, 259, 291, 334, 381, 400, 710 (20 Sectors) |
| Kerala | 204, 233, 252, 300, 310, 319, 333, 399, 710 (9 Sectors) |
| Madhya Pradesh | 205, 206, 212, 231, 239, 251, 259, 311, 312, 339, 384, 511, 720 (13 Sectors) |
| Maharashtra | 031, 042, 206, 243, 280, 310, 312, 321, 350, 360, 391, 392, 393, 399, 400, 511 (16 Sectors) |
| Orissa | 011, 207, 220, 251, 313, 331, 332, 341 (8 Sectors) |
| Punjab and Haryana | 041, 043, 080, 206, 209, 211, 212, 239, 339, 341, 360, 361, 370, 384, 391, 710, 720 (17 Sectors) |
| Rajasthan | 041, 042, 120, 160, 170, 180, 205, 211, 212, 239, 259, 342, 384, 391 (14 Sectors) |
| Tamil Nadu | 011, 080, 140, 207, 259, 260, 291, 300, 333, 334, 394, 400, 710 (13 Sectors) |
| Uttar Pradesh | 043, 090, 203, 205, 206, 213, 214, 232, 241, 243, 259, 280, 293, 311, 332, 341, 384, 395, 710 (19 Sectors) |
| West Bengal | 110, 205, 212, 214, 231, 232, 252, 260, 271, 280, 300, 313, 319, 333, 341, 370, 382, 389, 394, 400, 511, 720 (22 Sectors) |

Appendix 3.2(c) : Sectors where Forward and Backward Linkages in States are higher than in All India

| | |
|-----------------------|--|
| Andhra Pradesh | 011, 021, 180, 209, 231, 260, 310, 311, 319, 332, 333, 340, 342, 350, 379, 381, 382, 385 (18 Sectors) |
| Assam | 070, 205, 231, 311, 340, 350, 385, 399 (8 Sectors) |
| Bihar | 041, 090, 120, 205, 209, 231, 251, 252, 260, 291, 319, 332, 382, 511 (14 Sectors) |
| Gujarat | 021, 069, 070, 080, 090, 140, 180, 251, 252, 259, 280, 331, 340, 350, 360, 361, 383, 391, 399 (19 Sectors) |
| Jammu and Kashmir | 140, 209, 280, 311, 350, (5 Sectors) |
| Karnataka | 021, 070, 080, 090, 231, 252, 260, 313, 319, 333, 339, 340, 342, 385, 511 (15 Sectors) |
| Kerala | 080, 090, 205, 231, 280, 340, 350, 361, 391, (9 Sectors) |
| Madhya Pradesh | 011, 021, 031, 041, 042, 070, 207, 209, 220, 260, 271, 280, 319, 360, 382, 385, 391, 399, 400 (19 Sectors) |
| Maharashtra | 011, 021, 069, 070, 080, 090, 110, 140, 202, 209, 259, 311, 333, 340, 342, 361, 381, 383, 386, 389, (20 Sectors) |
| Orissa | 070, 110, 180, 209, 231, 291, 350, 370, 382 (9 Sectors) |
| Punjab and Haryana | 069, 090, 140, 231, 232, 233, 251, 291, 311, 313, 331, 332, 340, 382, 385, 399 (16 Sectors) |
| Rajasthan | 011, 021, 031, 069, 070, 207, 231, 271, 332, 333, 339, 340, 360, 370, 399 (15 Sectors) |
| Tamil Nadu | 031, 043, 044, 069, 090, 231, 232, 239, 251, 271, 310, 313, 319, 331, 332, 339, 340, 342, 370, 383, 391 (21 Sectors) |
| Uttar Pradesh | 011, 070, 170, 209, 233, 252, 260, 313, 319, 331, 333, 340, 350, 360, 370, 383, 385, 391, 399 (19 Sectors) |
| West Bengal | 090, 202, 203, 207, 208, 211, 213, 243, 251, 293, 310, 339, 340, 361, 392 (15 Sectors) |

Appendix 3.2(d) : Sectors where both Forward and Backward Linkages in States are lower than in All India

| | |
|--------------------|--|
| Andhra Pradesh | 070, 170, 208, 211, 334, 361, 384, 386 (8 Sectors) |
| Assam | 011, 021, 031, 069, 080, 090, 110, 130, 209, 251, 321, 329, 381, 382, 384, 386, 710, (17 Sectors) |
| Bihar | 011, 021, 031, 080, 110, 140, 160, 208, 220, 232, 310, 321, 340, 360, 381, 384 (16 Sectors) |
| Gujarat | 031, 130, 150, 205, 311, 312, 332, 334, 381, 385, 392, 394, 710 (13 Sectors) |
| Jammu and Kashmir | 011, 021, 042, 069, 070, 080, 090, 251, 511 (9 Sectors) |
| Karnataka | 011, 041, 043, 069, 120, 140, 170, 202, 204, 214, 232, 243, 251, 271, 361, 382, 383, 384, 391, 392, 720 (21 Sectors) |
| Kerala | 011, 021, 042, 043, 044, 069, 070, 203, 209, 232, 239, 251, 260, 271, 311, 331, 341, 342, 370, 381, 384, 400, 720 (23 Sectors) |
| Madhya Pradesh | 080, 090, 110, 140, 170, 202, 208, 211, 232, 334, 340, 342, 710, (13 Sectors) |
| Maharashtra | 120, 205, 208, 214, 231, 232, 233, 239, 252, 260, 300, 313, 319, 339, 382, 384, 385, 394, 710, 720, (20 Sectors) |
| Orissa | 021, 031, 041, 042, 069, 080, 090, 120, 140, 205, 260, 271, 280, 310, 333, 334, 340, 360, 383, 384, 394, 511, 710, 720, (24 Sectors) |
| Punjab and Haryana | 021, 042, 070, 202, 205, 271, 310, 333, 334, 350, 383, 400, 511 (13 Sectors) |
| Rajasthan | 080, 090, 140, 232, 243, 311, 334, 341, 382, 400, 511, 710, 720 (13 Sectors) |
| Tamil Nadu | 021, 041, 042, 170, 208, 209, 214, 220, 243, 311, 360, 381, 382, 384, 386, 389, 399, 511, 720, (19 Sectors) |
| Uttar Pradesh | 021, 031, 041, 042, 069, 080, 202, 207, 212, 220, 291, 361, 382, 386, 511, 720 (16 Sectors) |
| West Bengal | 011, 031, 041, 042, 069, 070, 080, 206, 209, 233, 329, 332, 342, 350, 381, 383, 384, 385, 386, 391, 395, 399, 710 (23 Sectors) |

Appendix 3.3 : Sectors deviating from All-India Chenery-watanabe Classification

| State | All India | I High w, Low u | II High w, Low u | III Low w, High u | IV Low w, Low u |
|-------------------|-----------|-----------------------|-------------------------------|---------------------------|-----------------------|
| Andhra Pradesh | I | - | - | - | 041, 042, 180 |
| | II | - | - | 205, 319, 382 383, 399 | - |
| | III | - | 339, 389, 312 | - | 710, 720 |
| | IV | - | 211 | 361 | - |
| Assam | I | - | - | - | - |
| | II | - | - | 205, 319, 341 385, 399 | - |
| | III | - | 209, 321 | - | 720 |
| | IV | 140 | - | 381 | - |
| Bihar | I | - | - | 399 | 041 |
| | II | 150 | - | 205, 231, 291 319, 382 | - |
| | III | 043 | 211, 259, 310, 329, 340 | - | 710, 720 |
| | IV | 110 | - | 160, 381 | - |
| Gujarat | I | - | 233 | 382 | - |
| | II | - | - | 383, 391 | - |
| | III | - | 312, 511 | - | - |
| | IV | 130, 150 | - | - | - |
| Jammu and Kashmir | I | - | - | - | 031 |
| | II | 140 | - | 319, 334, 339 | 041 |
| | III | - | 211, 259, 511 | - | 720 |
| | IV | - | - | - | - |
| Karnataka | I | - | - | - | - |
| | II | - | - | 205, 341, 385 399 | - |
| | III | 150 | 259, 271 | - | 044, 710 |
| | IV | 043, 120 | - | 383 | - |

Appendix 3.3 : (Contd.)

| State | All India | I High w, Low u | II High w, Low u | III Low w, High u | IV Low w Low u |
|--------------------|-----------|-----------------------|------------------------------------|--|----------------------|
| Kerala | I | - | - | - | 031, 041, 080 |
| | II | - | - | 205, 231, 334 341, 360 | - |
| | III | - | 209, 331 | - | 710, 720 |
| | IV | - | - | 203 | - |
| Madhya Pradesh | I | - | - | - | 042, 069 |
| | II | - | - | 341, 382, 399 | - |
| | III | - | 211, 259, 339, 340, 511 | - | - |
| | IV | - | - | - | - |
| Maharashtra | I | - | 211, 331, 333 | - | - |
| | II | - | - | 334, 341 | - |
| | III | - | 300, 313, 321, 350 | - | - |
| | IV | 120 | 339, 511 | 220, 231, 260, 280, 381, 382, 384, 386, 391, 393, 394 | - |
| Orissa | I | - | - | - | - |
| | II | - | - | 319, 382 | - |
| | III | - | 271, 313, 331, 332, 333, 340 | - | 720 |
| | IV | - | - | - | - |
| Punjab and Haryana | I | - | 511 | 319 | 069 |
| | II | 140 | - | 291, 382, 399 | - |
| | III | - | 211, 271 | - | 710, 720 |
| | IV | 043 | 333 | - | - |

Appendix 3.3 : (Contd.)

| State | All India | I High w, Low u | II High w, Low u | III Low w, High u | IV Low w Low u |
|-------------------|-----------|-----------------------|---|------------------------------------|----------------------|
| Rajasthan | I | - | - | - | 069 |
| | II | - | - | 319, 399 | - |
| | III | - | 211, 259, 311, 511 | - | 041 |
| | IV | 120, 170 | - | - | - |
| Ramil and Nadu | I | - | - | - | - |
| | II | - | - | 205, 341 | 044 |
| | III | - | 209, 259, 300, 389 | - | 710 |
| | IV | - | - | 381, 386 | - |
| Uttar Pradesh | I | - | - | - | 041 |
| | II | 043 | - | 319, 334, 399 | - |
| | III | - | 293, 332, 511 | - | 710, 720 |
| | IV | - | - | - | - |
| West Bengal | I | - | 331 | - | 021, 090 |
| | II | - | - | 207 | - |
| | III | - | 209, 233, 300, 313, 329, 332, 333, 350, 389 | - | - |
| | IV | - | - | 070, 220, 381, 386, 393, 395 | - |

Seminar on
DEVELOPMENT AND INTER-REGIONAL DISPARITIES:
THE INDIAN EXPERIENCE

Organised by
Guru Institute of Development Studies
Lucknow

on
March 19 - 21, 1983

INSTITUTIONAL FINANCE FOR INDUSTRY
AND REGIONAL DISPARITIES IN INDIA

A paper presented
by
DR. P. ASTHANA
Deputy General Manager
INDUSTRIAL DEVELOPMENT BANK OF INDIA, BOMBAY

Institutional Finance for Industry
and Regional Disparities in India.

By
Dr. P. ASTHANA

Institutional finance has played an important role in the industrialisation of Independent India. Special financial institutions were created to supplement the limited resources available with individual entrepreneurs. Today there are four all-India financial institutions namely Industrial Development Bank of India (IDBI), Industrial Finance Corporation of India (IFCI), Industrial Credit and Investment Corporation of India (ICICI), Industrial Reconstruction Corporation of India (IRCI); three investment corporations viz. Life Insurance Corporation of India (LIC), Unit Trust of India(UTI), General Insurance Corporation of India (GIC) and State level agencies such as State Financial Corporations(SFCs) and State Industrial Development Corporations (SIDs)- all financing and promoting industries. Table 1 below shows percentages growth in assistance sanctioned and disbursed during 1980-81 over 1979-80 by all the financial institutions excluding inter-institutional flow.

TABLE - I

Growth in Assistance sanctioned and Disbursed by All Financial Institutions during 1980-81.

| Period: April-March | | (in Percentage terms) |
|---------------------|------------------|-----------------------|
| | <u>Sanctions</u> | <u>Disbursements</u> |
| 1 ILB | 21.0 | 35.9 |
| 2 IFCI | 53.5 | 19.4 |
| 3 ICICI | 53.9 | 28.8 |
| 4 LIC | 38.8 | 55.8 |
| 5 UTI | -44.7 | -20.2 |
| 6 GIC | -53.4 | -15.4 |
| 7 IRCL | 23.7 | 34.3 |
| 8 SFCs | 43.0 | 34.2 |
| 9 SICCs | 39.4 | 49.3 |
| TOTAL | 26.65 | 31.11 |

Source: Report on Development Banking in India 1980-81.

The financial institutions have actively participated in increasing the overall investment activity in the country. Not only this, over the years the industrial sector's reliance on financial assistance has also increased.

Table II next page presents data on disbursements by all the financial institutions to private corporate sector industries from 1970-71 to 1977-78 in relation to gross fixed capital formation by medium and large public limited companies covered by RBI Company finance studies. The companies included in these studies are each with paid-up capital of Rs. 5 lakhs and more, representing the bulk of private industrial sector.

Disbursements of the institutions to the private corporate sector during 1970-71 was 144 crore rupees forming 47% of the

gross fixed capital formation of the companies covered by RBI studies. By 1977-78, this share increased to 72%.

Table II
Role of Financial Institutions in Capital Formation
in the Organised Private Manufacturing Sector.

| Year (1) | Disbursement of institutional assistance to private sector companies + (in crores of rupees) | Gross fixed capital formation of medium and large public ltd companies £ (in crores of rupees) | (2) as percentage of (3) | |
|-------------|--|--|--------------------------------|-----|
| | | | (2) | (3) |
| 1970-71 | 144 | 304 | 47.4 | |
| 1971-72 | 161 | 376 | 42.8 | |
| 1972-73 | 194 | 468 | 41.5 | |
| 1973-74 | 267 | 525 | 50.9 | |
| 1974-75 | 353 | 691 | 51.1 | |
| 1975-76 | 365 | 747 | 48.9 | |
| 1976-77 | 441 | 630 | 70.0 | |
| 1977-78 | 540 | 753 | 71.7 | |
| 1978-79 | 704 | N.A. | - | |
| 1979-80 | 914 | N.A. | - | |
| 1980-81 | 1164 | N.A. | - | |

+ covers IDBI, IFICI, ICICI, LIC, UTI, IRCA, SFCs, SIDs.
In both column (2) and (3) joint and co-operative sectors
are included.

f The capital formation data given here relate to RBI Company
Finance Studies of medium and large public limited companies
each with paid-up capital of Rs.5 lakhs and more.

N.A. Not available.

Source: Report on Development Banking in India 1980-81.

Comparing the amounts of annual disbursements made by all the financial institutions to the private sector with the amounts of capital raised by companies in the capital market, similar trend may be noticed. The ratio of amounts raised in the capital market by companies to institutional disbursements was 1:3.1 in 1975-76. It had increased to 1:6.6 (almost double) by 1979-80. Table III presents the growing role of institutional finance in relation to capital market borrowing by the private sector.

Table III

| Year | Institutional Assistance in Relation to Capital Raised by companies against consents/acknowledgements of proposals. | | |
|---------|---|------------------|-----------------------|
| | Disbursements by institutions to private sector companies + | Capital raised £ | (2) as a ratio of (3) |
| (1) | (2) | (3) | |
| 1975-76 | 365 | 117 | 3.1 |
| 1976-77 | 441 | 168 | 2.6 |
| 1977-78 | 540 | 170 | 3.2 |
| 1978-79 | 704 | 183 | 3.8 |
| 1979-80 | 914 | 138 | 6.6 |
| 1980-81 | 1164 | N.A. | - |

+ Institutions covered are IDBI, IFCI, ICICI, LIC, UTI, IRCL, SFCs, SIDCs.

£ Capital raised relates to the issue of equity, preference shares and debentures by new and existing public & private limited, Government and Non-Government companies against consents/acknowledgement of proposals under Capital Issues Control.

N.A. Not available.

Note: Column (2) relates to the financial year, column (3) refers to the calender year (for e.g. 1975-76 relates to the calender year 1975).

Source: Report on Development Banking in India 1980-81.

Undoubtedly, institutional financing is playing an important role in the promotion of industries. Let us now turn our attention to regional dispersal of funds by these institutions. It has been widely held that the already developed states manipulate and receive most of the institutional assistance. As a result, the benefits of institutional finance are directed towards a selected few and regional disparities keeps widening against the governments' declared policy of balanced regional developments. The data, however, shows that over the years the share of the states notified as industrially backward by the Pande Committee has increased both in institutional assistance sanctioned and disbursed. Arranged in ascending order of industrial development, the notified backward states are Nagaland, Jammu and Kashmir, Orissa, Uttar Pradesh, Assam, Madhya Pradesh, Rajasthan, Bihar and Andhra Pradesh. The percentage share of J&K, Orissa, Andhra, Rajasthan, Madhya Pradesh in total assistance sanctioned has increased substantially from 1964-65 to 1980-81 while that of U.P. shows a mixed trend with substantial increase during 1975-76 to 1977-78. The share of Nagaland remained negligible all through. Only the share of two backward states- Assam and Bihar- had fallen.

The overall position also shows an increased percentage share of these nine backward States in total sanctions. Their share has increased from one fourth to approximately one third between 1969-74 and 1980-81. The share of these states in disbursement of assistance has also touched a 30 percent mark in 1980-81 as compared to 26 percent during 1969-74. Disbursement of funds almost follows the pattern of sanctions with a time lag.

While the share of industrially backward states in total institutional finance has gone up over the years, that of industrially developed states viz. Maharashtra, Gujarat, West Bengal, Tamilnadu, Karnataka, has registered a fall. Maharashtra contributing about one-fourth of total industrial production, had accounted for almost one-fourth of total assistance sanctioned during 1969-74; it had dropped to 13% by 1977-78, after an increasing trend during the following three years, its share stabilised at about 21% by 1980-81. The cumulative share of the state upto March end 1981 was also 21%. Similarly, the share of Gujarat has fallen from 13.28% in 1969-74 to 10.09% in 1980-81. Similar trend was noticed in the case of Tamilnadu, West Bengal and Karnataka. Table IV presents the percentage share of different states in institutional assistance sanctioned and disbursed.

Baring Assam, in all other backward states per capita assistance sanctioned and disbursed has also increased. In 1976-77, all these states had per capita sanctions and disbursement below all India average (see table V). By 1980-81, atleast three states had crossed the all India average.

The above analysis clearly shows that the all-India financial institutions have tried to disperse industrial assistance (funds) in a modest way. Relatively more and more funds are being diverted towards lesser industrialised states. No doubt, much more is desired and is yet to be done.

It may be pointed out that the financial institutions by themselves cannot overhaul the system. An integrated approach is essential. There are three most important plausible factors responsible for any states' share in industrial assistance :

- (i) Licences issued for setting up industry in that area
- (ii) Availability of entrepreneurs bringing viable projects for assistance
- (iii) State governments contribution in industrial development.

A quick look at the state-wise distribution of industrial licences issued during 1953-1982 reflects a bias in favour of industrially developed states. The situation is depicted in table VI. The proportion of licences issued to industrially developed states is declining over the years, still about two third licences are going to these states, once they have licence their legitimate claim over the assistance from institutions is established and invariably more funds, despite institutional resistance, get pumped into already developed states.

Table VI

State-wise Distribution of Number
of Industrial Licences Issued during 1953-1982.
(Figures are percentages to All-India total)

| State | 1953- | 1956- | 1959- | 1967- | 1970- | 1980 | 1981 | 1982 |
|------------------|-------|-------|-------|-------|-------|-------|------|-------------|
| | -61 | -66 | -66 | -74 | -740 | | | (upto Oct.) |
| <u>Developed</u> | | | | | | | | |
| West Bengal | 18.7 | 16.5 | 18.0 | 12.1 | 10.1 | 5.0 | 7.1 | 5.8 |
| Tamil Nadu | 10.0 | 9.7 | 8.2 | 8.0 | 8.7 | 7.7 | 6.7 | 10.0 |
| Gujarat | 7.6 | 8.9 | 7.5 | 10.6 | 10.7 | 17.89 | 16.8 | 16.4 |
| Maharashtra | 27.3 | 27.4 | 31.9 | 28.4 | 26.7 | 22.5 | 24.3 | 21.79 |
| Punjab | 7.3 | 6.3 | 7.0 | 3.3 | 2.8 | 3.7 | 3.5 | 3.3 |
| Haryana | - | - | - | 0.1 | 0.1 | 4.2 | .2 | 1.2 |
| Karnataka | 3.8 | 3.2 | 3.7 | 5.1 | 5.7 | 8.4 | 5.2 | 7.6 |
| Kerala | 4.1 | 3.6 | 2.2 | 1.7 | 1.7 | 2.3 | 3.1 | 2.3 |
| Total | 78.8 | 75.6 | 78.5 | 69.3 | 66.5 | 67.0 | 66.9 | 68.39 |

| State | 1953- -61 | 1956- -66 | 1959- -66 | 1967- -66 | 1970- -74@ | 1980 | 1981 | 1982 (upto Oct.) |
|------------------|--------------|--------------|--------------|--------------|---------------|------|------|---------------------|
| <u>Backward</u> | | | | | | | | |
| Andhra Pradesh | 2.8 | 3.3 | 3.1 | 4.7 | 5.1 | 8.8 | 8.1 | 6.6 |
| Bihar | 2.9 | 5.1 | 3.2 | 3.8 | 3.2 | .8 | 1.4 | - |
| Rajasthan | 1.3 | 1.8 | 1.6 | 2.5 | 2.6 | 3.1 | 5.6 | 3.3 |
| Madhya Pradesh | 1.7 | 2.5 | 3.9 | 2.2 | 2.5 | 3.7 | 3.1 | 2.0 |
| Assam | 1.0 | 0.9 | 0.8 | 1.1 | 1.1 | 1.0 | 1.4 | - |
| U.P. | 7.4 | 6.7 | 5.3 | 8.4 | 9.5 | 6.3 | 5.4 | 5.6 |
| Orissa | 1.3 | 1.2 | 1.2 | 0.8 | 0.8 | 1.6 | 1.0 | 2.3 |
| J & K | - | - | - | 0.1 | 0.2 | .2 | .6 | .5 |
| Nagaland | - | - | - | neg | neg | N.A. | N.A. | N.A. |
| Total | | | | | | | | |
| Himachal Pradesh | 0.1 | - | - | 4.5 | 5.6 | .4 | .2 | 1.2 |
| Manipur | - | - | - | neg | neg | - | .2 | - |
| Meghalaya | - | - | - | 0.1 | 0.1 | N.A. | N.A. | N.A. |

Notes:

@ Includes figures only for the first half of 1974

- Nil

N.A. Not available

Source: Backward Area Development: Strategies & Policies, MDI, New Delhi and

In addition, the entrepreneurial skill is more developed in developed states and the states governments are also drawing up their plans so as to assist entrepreneurs within their territories. All these factors affect the institutions effort of wider dispersal of industrial assistance. Though there is a long way to go yet it may be said to the credit of financial institutions that they are moving in the right direction.

Table iv

Statewise Distribution of Assistance Sanctioned and Disbursed by All-India Financial Institutions
(In Percentage Terms) From 1969-74 to 1980-81 (April-March)

| Name of State | Sanctions | | | | | | | | | Upto end March '81 Cumulative |
|-------------------|--------------|--------------|--------------|--------------|--------------|---------------|-----------------------|-------|-------|-------------------------------------|
| | 1 1969-74 | 2 1974-75 | 3 1975-76 | 4 1976-77 | 5 1977-78 | 6 1978-79* | 7 1979-80+1980-81+ | 8 | 9 | |
| Assam | 2.51 | 0.83 | 1.23 | 0.98 | 0.35 | •43 | •34 | •33 | •86 | |
| Bihar | 5.98 | 2.10 | 3.09 | 3.88 | 3.99 | 3.64 | 2.21 | 3.23 | 3.58 | |
| Manipur | - | neg | - | .02 | .01 | .04 | .04 | .02 | .02 | |
| Meghalaya | .01 | .03 | .86 | .31 | .04 | .05 | .03 | .05 | .11 | |
| Nagaland | .08 | neg | .05 | neg | neg | .01 | .07 | .03 | .03 | |
| Orissa | 1.72 | 1.44 | 2.99 | 1.97 | 1.43 | 2.30 | 2.62 | 2.18 | 2.04 | |
| Sikkim | - | - | - | - | negligible | .01 | neg | neg | .05 | |
| Tripura | neg | - | neg | .02 | .26 | .04 | 0.05 | .04 | 6.98 | |
| West Bengal | 9.62 | 5.95 | 7.71 | 8.31 | 8.30 | 10.93 | 5.66 | 4.12 | | |
| Eastern Region | 19.92 | 10.35 | 15.93 | 15.49 | 14.38 | 17.44 | 11.03 | 10.00 | 13.67 | |
| Gujarat | 13.28 | 10.19 | 10.07 | 10.29 | 22.46 | 14.71 | 16.24 | 10.09 | 13.38 | |
| Madhya Pradesh | 2.60 | 3.62 | 1.89 | 3.19 | 2.36 | 11.98 | 3.93 | 2.90 | 2.96 | |
| Maharashtra | 24.11 | 23.55 | 16.47 | 16.52 | 13.01 | 20.99 | 22.11 | 21.18 | 21.43 | |
| Western Region | 39.99 | 37.36 | 28.43 | 30.00 | 37.83 | 47.68 | 42.28 | 34.17 | 37.77 | |
| Total | | | | | | | | | | |
| Haryana | 2.73 | 2.37 | 1.84 | 2.81 | 3.07 | 1.87 | 2.44 | 2.86 | 2.60 | |
| Himachal Pradesh | 1.19 | .36 | .61 | .78 | .72 | .36 | .36 | 1.20 | .58 | |
| Jammu & Kashmir | .06 | .34 | .42 | 1.54 | .68 | .65 | .57 | 1.09 | .67 | |
| Punjab | 1.45 | 2.35 | 2.12 | 2.72 | 1.83 | 3.57 | 2.67 | 6.49 | 3.17 | |
| Rajasthan | 1.64 | 4.97 | 2.20 | 4.01 | 4.19 | 3.94 | 3.94 | 7.56 | 4.39 | |
| U.P. | 6.91 | 6.69 | 10.96 | 11.64 | 9.70 | 6.06 | 8.25 | 5.96 | 7.50 | |
| Northern Region | 12.98 | 17.08 | 18.15 | 23.50 | 20.19 | 16.45 | 18.23 | 25.16 | 18.91 | |
| Total | | | | | | | | | | |
| Andhra Pradesh | 3.35 | 3.57 | 4.77 | 9.34 | 4.89 | 6.54 | 3.86 | 7.70 | 5.82 | |
| Karnataka | 7.14 | 10.75 | 8.37 | 6.14 | 8.11 | 5.92 | 8.36 | 9.19 | 7.79 | |
| Kerala | 2.31 | 3.70 | 4.66 | 2.53 | 3.38 | 2.44 | 5.49 | 2.55 | 3.27 | |
| Tamil Nadu | 10.96 | 11.44 | 13.60 | 9.07 | 8.07 | 9.93 | 8.27 | 8.69 | 9.65 | |
| Southern Region | 23.76 | 29.46 | 31.40 | 27.08 | 24.45 | 24.83 | 25.98 | 28.13 | 26.53 | |
| Total | | | | | | | | | | |
| Union Territories | 3.25 | 5.63 | 5.96 | 3.80 | 3.01 | 2.82 | 2.37 | 2.39 | 3.03 | |
| Total share of | 24.85 | 23.56 | 27.6 | 36.55 | 27.59 | 35.55 | 25.79 | 30.98 | 27.85 | |

Table iv

Statewise Distribution of Assistance Sanctioned and Disbursed by All-India Financial Institutions
(In Percentage Terms) From 1969-74 to 1980-81 (April-March)

| Name of State | Sanctions | | | | | | | | Upto end March '81 | Cumulative |
|--------------------------|-----------|---------|---------|---------|---------|----------|------------------|-------|-----------------------|------------|
| | 1969-74 | 1974-75 | 1975-76 | 1976-77 | 1977-78 | 1978-79* | 1979-80+1980-81+ | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Assam | 2.51 | 0.83 | 1.23 | 0.98 | 0.35 | 43 | 34 | 33 | 33 | .86 |
| Bihar | 5.98 | 2.10 | 3.09 | 3.88 | 3.99 | 3.64 | 2.21 | 3.23 | 3.58 | 3.58 |
| Manipur | - | neg | - | - | .02 | .01 | .04 | .04 | .02 | .02 |
| Meghalaya | .01 | .03 | .86 | .31 | .04 | .05 | .03 | .05 | .11 | .11 |
| Nagaland | .08 | neg | .05 | neg | .01 | .07 | .03 | .03 | .03 | .03 |
| Orissa | 1.72 | 1.44 | 2.99 | 1.97 | 1.43 | 2.30 | 2.62 | 2.18 | 2.04 | 2.04 |
| Sikkim | - | neg | - | neg | .02 | .26 | .04 | .05 | .05 | .05 |
| Tripura | neg | 5.95 | 7.71 | 8.31 | 8.30 | 10.93 | 5.66 | 4.12 | 6.98 | 6.98 |
| West Bengal | 9.62 | - | - | - | - | - | - | - | - | - |
| Eastern Region | 19.92 | 10.35 | 15.93 | 15.49 | 14.38 | 17.44 | 11.03 | 10.00 | 13.67 | 13.67 |
| Total | . | . | . | . | . | . | . | . | . | . |
| Gujarat | 13.28 | 10.19 | 10.07 | 10.29 | 22.46 | 14.71 | 16.24 | 10.09 | 13.38 | 13.38 |
| Madhya Pradesh | 2.60 | 3.62 | 1.89 | 3.19 | 2.36 | 11.98 | 3.93 | 2.90 | 2.96 | 2.96 |
| Maharashtra | 24.11 | 23.55 | 16.47 | 16.52 | 13.01 | 20.99 | 22.11 | 21.18 | 21.43 | 21.43 |
| Western Region | 39.99 | 37.36 | 28.43 | 30.00 | 37.83 | 47.68 | 42.28 | 34.17 | 37.77 | 37.77 |
| Total | . | . | . | . | . | . | . | . | . | . |
| Haryana | 2.73 | 2.37 | 1.84 | 2.81 | 3.07 | 1.87 | 2.44 | 2.86 | 2.60 | 2.60 |
| Himachal Pradesh | 1.19 | .36 | .61 | .78 | .72 | .36 | .36 | 1.20 | .58 | .58 |
| Jammu & Kashmir | .06 | .34 | .42 | 1.54 | .68 | .65 | .57 | 2.67 | 3.17 | 3.17 |
| Punjab | 1.45 | 2.35 | 2.12 | 2.72 | 1.83 | 3.57 | 2.67 | 6.49 | 4.39 | 4.39 |
| Rajasthan | 1.64 | 4.97 | 2.20 | 4.01 | 4.19 | 3.94 | 3.94 | 7.56 | 7.56 | 7.56 |
| U.P. | 6.91 | 6.69 | 10.96 | 11.64 | 9.70 | 6.06 | 8.25 | 5.96 | 7.50 | 7.50 |
| Northern Region | 12.98 | 17.08 | 18.15 | 23.50 | 20.19 | 16.45 | 18.23 | 25.16 | 18.91 | 18.91 |
| Total | . | . | . | . | . | . | . | . | . | . |
| Andhra Pradesh | 3.35 | 3.57 | 4.77 | 9.34 | 4.89 | 6.54 | 3.86 | 7.70 | 5.82 | 5.82 |
| Karnataka | 7.14 | 10.75 | 8.37 | 6.14 | 8.11 | 5.92 | 8.36 | 9.19 | 7.79 | 7.79 |
| Kerala | 2.31 | 3.70 | 4.66 | 2.53 | 3.58 | 2.44 | 5.49 | 2.55 | 3.27 | 3.27 |
| Tamil Nadu | 10.96 | 11.44 | 13.60 | 9.07 | 8.07 | 9.93 | 8.27 | 8.69 | 9.65 | 9.65 |
| Southern Region | 23.76 | 29.46 | 31.40 | 27.08 | 24.45 | 24.83 | 25.98 | 28.13 | 26.53 | 26.53 |
| Total | . | . | . | . | . | . | . | . | . | . |
| Union Territories | 3.25 | 5.63 | 5.96 | 3.80 | 3.01 | 2.82 | 2.37 | 2.39 | 3.03 | 3.03 |
| Total share of States | 24.85 | 23.56 | 27.6 | 36.55 | 27.59 | 35.55 | 25.79 | 30.98 | 27.85 | 27.85 |

Table 4 (contd.)

| Name of State | Disbursements | | | | | | | | Cumulative+ |
|-------------------------------------|---------------|---------|---------|---------|---------|----------|----------|----------|-------------|
| | 1969-74 | 1974-75 | 1975-76 | 1976-77 | 1977-78 | 1978-79* | 1979-80+ | 1980-81+ | |
| 1 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Assam | 1.54 | 2.99 | 2.14 | 1.80 | .74 | .49 | .54 | .33 | 1.09 |
| Bihar | 6.83 | 2.81 | 3.76 | 4.36 | 3.60 | 2.17 | 2.12 | 1.98 | 3.32 |
| Manipur | - | neg | - | neg | .04 | neg | .01 | .03 | .01 |
| Meghalaya | neg | .05 | .09 | .50 | .42 | .20 | .09 | .05 | .14 |
| Nagaland | .05 | .15 | .02 | .03 | .01 | neg | .03 | .03 | .03 |
| Orissa | 1.65 | 1.86 | 1.40 | 1.31 | 1.47 | 1.43 | 2.07 | 2.23 | 1.81 |
| Sikkim | - | - | - | - | - | - | .01 | .01 | neg |
| Tripura | .01 | - | neg | .03 | .11 | .13 | .04 | .10 | .06 |
| West Bengal | 8.33 | 9.15 | 8.44 | 8.34 | 7.05 | 7.49 | 6.94 | 6.45 | 7.25 |
| Eastern Region Total | 18.41 | 17.01 | 15.85 | 16.37 | 13.44 | 11.91 | 11.85 | 11.21 | 13.71 |
| Gujarat | 11.42 | 12.54 | 10.39 | 10.80 | 14.45 | 20.24 | 13.37 | 11.86 | 13.26 |
| Madhya Pradesh | 3.27 | 1.31 | 2.25 | 2.28 | 2.36 | 2.58 | 3.91 | 2.96 | 2.78 |
| Maharashtra | 25.95 | 21.38 | 21.76 | 16.92 | 18.91 | 14.91 | 19.52 | 23.13 | 22.12 |
| Western Region Total | 40.64 | 35.23 | 34.4 | 30.00 | 35.72 | 37.73 | 36.80 | 37.95 | 38.16 |
| Haryana | 3.11 | 1.94 | 2.11 | 3.14 | 2.87 | 3.16 | 2.88 | 2.14 | 2.65 |
| Himachal Pradesh | .16 | .22 | .65 | .39 | .44 | .59 | .56 | .69 | .45 |
| Jammu & Kashmir | .07 | .32 | .61 | .55 | .49 | .99 | .89 | .71 | .71 |
| Punjab | 1.35 | 1.88 | 1.85 | 2.56 | 2.77 | 2.43 | 3.08 | 3.41 | 2.46 |
| Rajasthan | 2.36 | 1.70 | 4.05 | 3.49 | 3.62 | 3.44 | 5.20 | 5.27 | 3.80 |
| Uttar Pradesh | 6.71 | 7.74 | 4.38 | 6.69 | 9.49 | 9.16 | 7.93 | 7.53 | 7.36 |
| Northern Region Total | 13.76 | 13.80 | 13.65 | 16.82 | 20.68 | 19.77 | 20.64 | 19.93 | 17.43 |
| Andhra Pradesh | 3.79 | 3.23 | 3.15 | 5.70 | 7.54 | 7.98 | 6.89 | 5.67 | 5.87 |
| Karnataka | 6.25 | 10.08 | 12.09 | 7.90 | 6.17 | 7.51 | 9.70 | 8.52 | 8.05 |
| Kerala | 2.11 | 2.62 | 4.02 | 6.46 | 3.22 | 3.14 | 2.68 | 3.10 | 2.98 |
| Tamil Nadu | 11.32 | 13.15 | 10.96 | 12.19 | 9.02 | 7.93 | 8.08 | 10.56 | 10.21 |
| Southern Region Total | 23.47 | 29.08 | 30.22 | 32.25 | 25.95 | 26.56 | 27.35 | 27.85 | 27.11 |
| Union Territories | - | - | - | - | 9.22 | 3.26 | 2.92 | 2.92 | 3.49 |
| Total share of nine backward States | 26.27 | 22.11 | 76 | 26.21 | 30.32 | 28.24 | 29.68 | 26.89 | 26.77 |

* IDBI's assistance is inclusive of assistance under project loan, soft loan, TDF, underwriting, refinancing, rediscount, direct loans for exports and refinance of export credits.

+ Includes IDBI, IFCI, ICICI, LIC, UTI and GIC.

Table V

Per Capita Assistance Sanctioned and Disbursed by Financial Institutions (Rupees)

| States | 1976-77 | | | 1977-78 | | | 1978-79 | | | 1979-80 | | | 1980-81 | | | Cumulative upto end-March 1981 | | |
|--------------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|-----------------------------------|----------------|--------------------|
| | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | |
| Uttar Pradesh | 18.73 | 7.39 | 16.14 | 11.48 | 21.19 | 16.47 | 15.61 | 17.13 | 35.28 | 18.68 | 141.66 | 94.04 | 15.31 | 10.31 | 10.31 | 10.31 | | |
| Jammu & Kashmir | 4.74 | 5.52 | 2.57 | 2.87 | 3.66 | 2.77 | 3.40 | 3.49 | 3.83 | 2.56 | 55.41 | 50.81 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Rajasthan | 5.83 | 3.82 | 7.65 | 4.06 | 6.84 | 3.13 | 5.87 | 3.57 | 11.88 | 5.02 | 59.63 | 36.62 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Gujarat | 27.95 | 19.28 | 78.60 | 29.91 | 57.81 | 54.87 | 86.63 | 46.68 | 69.55 | 54.54 | 433.29 | 296.12 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Haryana | 20.68 | 15.71 | 30.82 | 12.36 | 20.43 | 25.25 | 35.48 | 25.94 | 48.84 | 26.05 | 218.07 | 160.84 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Punjab | 24.70 | 8.32 | 19.43 | 8.27 | 11.05 | 13.97 | 17.31 | 16.81 | 68.40 | 25.95 | 148.05 | 84.71 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Madhya Pradesh | 27.50 | 6.90 | 14.70 | 17.68 | 14.19 | 17.72 | 19.88 | 21.08 | 47.28 | 25.38 | 144.88 | 104.58 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Karnataka | 22.66 | 14.39 | 27.44 | 12.26 | 25.40 | 18.82 | 43.83 | 31.34 | 55.09 | 35.06 | 243.09 | 165.76 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Uttarakhand | 9.34 | 15.07 | 15.98 | 9.33 | 12.27 | 11.56 | 38.95 | 13.06 | 22.72 | 19.85 | 153.83 | 99.72 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Madhya Pradesh | 6.13 | 2.80 | 5.76 | 3.34 | 7.57 | 5.00 | 14.24 | 9.12 | 13.33 | 9.41 | 64.52 | 42.48 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Uttaranchal | 28.93 | 18.98 | 28.02 | 23.80 | 47.01 | 24.42 | 65.05 | 37.75 | 75.61 | 57.40 | 385.47 | 275.58 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Assam | 1.58 | 0.17 | 0.83 | 2.08 | 4.54 | 0.23 | 5.64 | 1.21 | 3.14 | 3.21 | 15.21 | 6.64 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Nagaland | 26.91 | 26.64 | 6.67 | 23.50 | 8.33 | 18.50 | 8.38 | 9.77 | 11.92 | 8.62 | 111.08 | 99.38 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Arunachal Pradesh | 1.33 | 3.83 | 1.83 | 2.33 | 6.67 | 5.17 | 20.50 | 4.88 | 8.88 | 6.88 | 167.63 | 76.50 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Assam | 6.71 | 2.95 | 6.68 | 4.15 | 12.27 | 5.54 | 12.27 | 10.08 | 21.24 | 16.10 | 94.38 | 57.51 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Jharkhand | 17.95 | 11.36 | 17.64 | 31.25 | 19.24 | 37.98 | 28.19 | 90.07 | 36.48 | 231.02 | 140.19 | 1.32 | 1.32 | 1.32 | 1.32 | | | |
| Uttarakhand | 11.46 | 6.33 | 15.26 | 8.04 | 16.64 | 10.36 | 23.56 | 19.81 | 50.23 | 25.70 | 141.36 | 87.41 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Chhattisgarh | - | - | - | 3.00 | 2.00 | 10.33 | 7.00 | 12.67 | 12.33 | 25.67 | 20.67 | 1.32 | 1.32 | 1.32 | 1.32 | | | |
| Odisha | 1.33 | 1.06 | 15.78 | 4.06 | 2.72 | 6.56 | 4.43 | 2.43 | 4.36 | 7.62 | 26.48 | 20.33 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Tamil Nadu | 17.52 | 14.67 | 16.14 | 12.12 | 25.09 | 14.14 | 30.80 | 19.26 | 42.06 | 33.51 | 220.72 | 161.98 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Jharkhand | 10.99 | 4.07 | 10.93 | 6.69 | 7.36 | 8.31 | 13.58 | 8.36 | 13.15 | 11.18 | 74.24 | 51.54 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| West Bengal | 15.93 | 9.32 | 16.94 | 9.33 | 23.23 | 13.15 | 23.33 | 13.37 | 22.12 | 21.30 | 157.85 | 115.36 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Union Territories: | 41.00 | 48.00 | - | 12.00 | 35.00 | 35.00 | 6.50 | 9.50 | 25.00 | 107.50 | 39.50 | - | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Andaman, Nicobar Islands | 1.00 | 0.30 | 3.60 | 2.30 | 1.67 | 8.76 | 6.00 | 2.09 | 5.00 | 3.91 | 20.09 | 16.09 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| Lakshadweep | 94.00 | 38.20 | 56.20 | 46.00 | 33.17 | 28.33 | 90.35 | 14.42 | 73.00 | 60.00 | 342.67 | 225.33 | 1.32 | 1.32 | 1.32 | 1.32 | | |
| All India Average | 15.31 | 9.49 | 13.15 | 11.09 | 20.76 | 14.55 | 27.83 | 37.39 | 39.30 | 30.04 | 219.87 | 182.43 | 1.32 | 1.32 | 1.32 | 1.32 | | |

Notes: 1. Institutions covered are IDBI, IFCI, ICICI, LIC, UIIC, HBL, GIC, SICs and SIDBs.
 2. Figures have been adjusted for inter-institutional inflows.
 3. IDBI figures exclude overseas buyers' credit, foreign lines of credit, overseas investments finance, institutions, seed capital & guarantee.

Table v
Per Capita Assistance Sanctioned and Disbursed by Financial Institutions (Rupees)

| States | 1976-77 | | | 1977-78 | | | 1978-79 | | | 1979-80 | | | 1980-81 | | | Cumulative upto end-March '81 | | | |
|----------------------|--------------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|----------------------------------|----------------|--------------------|--|
| | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | Sanc- tions | Disbur- sements | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | |
| Andhra Pradesh | 18.73 | 7.39 | 16.14 | 11.48 | 21.19 | 16.47 | 15.61 | 17.13 | 35.28 | 18.68 | 141.66 | 94.04 | | | | | | | |
| Assam | 4.74 | 5.52 | 2.57 | 2.87 | 3.66 | 2.77 | 3.40 | 3.49 | 3.83 | 2.56 | 55.41 | 50.81 | | | | | | | |
| Bihar | 5.83 | 3.82 | 7.65 | 4.06 | 6.84 | 3.13 | 5.87 | 3.57 | 11.88 | 5.02 | 59.63 | 36.62 | | | | | | | |
| Gujarat | 27.95 | 19.28 | 78.60 | 29.91 | 57.81 | 54.87 | 86.63 | 46.68 | 69.55 | 54.54 | 435.29 | 296.12 | | | | | | | |
| Haryana | 20.68 | 15.71 | 30.82 | 12.36 | 20.43 | 25.25 | 35.48 | 25.94 | 48.84 | 26.05 | 218.07 | 160.84 | | | | | | | |
| Himachal Pradesh | 24.70 | 8.32 | 19.43 | 8.27 | 11.05 | 13.97 | 17.31 | 16.81 | 68.40 | 25.95 | 148.05 | 84.71 | | | | | | | |
| Jammu & Kashmir | 27.50 | 6.90 | 14.70 | 17.68 | 14.19 | 17.72 | 19.88 | 21.08 | 47.28 | 25.38 | 144.88 | 104.58 | | | | | | | |
| Karnataka | 22.66 | 14.39 | 27.44 | 12.26 | 25.40 | 18.82 | 43.83 | 31.34 | 55.09 | 35.06 | 243.09 | 165.76 | | | | | | | |
| Kerala | 9.34 | 15.07 | 15.98 | 9.33 | 12.27 | 11.56 | 38.95 | 13.06 | 22.72 | 19.85 | 153.83 | 99.72 | | | | | | | |
| Madhya Pradesh | 6.13 | 2.80 | 5.76 | 3.34 | 7.57 | 5.00 | 14.24 | 9.12 | 13.33 | 9.41 | 64.52 | 42.48 | | | | | | | |
| Maharashtra | 28.93 | 18.98 | 28.02 | 23.80 | 47.01 | 24.42 | 65.05 | 37.75 | 75.61 | 57.40 | 385.47 | 275.58 | | | | | | | |
| Manipur | 1.58 | 0.17 | 0.83 | 2.08 | 0.23 | 5.64 | 1.21 | 3.14 | 3.21 | 15.21 | 6.64 | | | | | | | | |
| Meghalaya | 26.91 | 26.64 | 6.67 | 23.50 | 8.33 | 18.50 | 8.38 | 9.77 | 11.92 | 8.62 | 111.08 | 99.38 | | | | | | | |
| Nagaland | 1.33 | 3.83 | 2.33 | 2.33 | 6.67 | 5.17 | 20.50 | 4.88 | 8.88 | 6.88 | 107.63 | 76.50 | | | | | | | |
| Orissa | 6.71 | 2.95 | 6.68 | 4.15 | 12.27 | 15.54 | 18.36 | 10.08 | 21.24 | 16.10 | 94.33 | 57.51 | | | | | | | |
| Punjab | 17.95 | 11.36 | 17.64 | 16.74 | 31.25 | 19.24 | 37.98 | 28.19 | 90.07 | 36.48 | 231.02 | 140.19 | | | | | | | |
| Rajasthan | 11.46 | 6.33 | 15.26 | 8.04 | 16.64 | 10.36 | 23.56 | 19.81 | 50.23 | 25.70 | 141.36 | 87.41 | | | | | | | |
| Sikkim | - | - | - | 3.00 | 2.00 | 10.33 | 7.00 | 12.67 | 12.33 | 25.67 | 25.67 | 20.67 | | | | | | | |
| Tripura | 1.33 | 1.06 | 15.78 | 4.06 | 2.72 | 6.56 | 4.43 | 2.43 | 4.36 | 7.62 | 26.48 | 20.33 | | | | | | | |
| Tamil Nadu | 17.52 | 14.67 | 16.14 | 12.12 | 25.09 | 14.14 | 30.80 | 19.26 | 42.06 | 33.51 | 220.72 | 161.93 | | | | | | | |
| Uttar Pradesh | 10.99 | 4.07 | 10.98 | 6.69 | 7.36 | 8.31 | 13.58 | 8.86 | 13.15 | 11.18 | 74.24 | 51.54 | | | | | | | |
| West Bengal | 15.93 | 9.32 | 16.94 | 9.38 | 23.23 | 13.15 | 23.83 | 13.57 | 22.12 | 21.30 | 157.35 | 115.36 | | | | | | | |
| Union Territories: | 41.00 | 43.00 | - | 12.00 | 35.00 | 35.00 | 6.50 | 9.50 | 25.00 | 107.50 | 39.50 | | | | | | | | |
| Andaman, Nicobar | Arunachal Pradesh, | 1.00 | 0.30 | 3.60 | 2.30 | 1.67 | 8.76 | 6.00 | 2.09 | 5.00 | 3.91 | 20.09 | 16.09 | | | | | | |
| Mizoram | Delhi, Chandigarh | 21.45 | 17.13 | 13.40 | 20.24 | 31.73 | 26.53 | 29.83 | 37.39 | 39.30 | 30.04 | 219.87 | 182.43 | | | | | | |
| Goa, Daman, Diu | 171.32 | 110.00 | 194.00 | 128.32 | 135.55 | 136.09 | 137.50 | 34.67 | 207.58 | 164.25 | 1301.17 | 950.75 | | | | | | | |
| Pondicherry, Laksha- | All India Average | 94.00 | 33.20 | 56.20 | 46.00 | 33.17 | 23.33 | 90.35 | 14.42 | 73.00 | 60.00 | 342.67 | 225.33 | | | | | | |
| deep | | 15.31 | 9.49 | 13.35 | 11.69 | 20.76 | 14.75 | 27.83 | 13.15 | 34.33 | 33.65 | 167.52 | 115.97 | | | | | | |

Notes: 1. Institutions covered are IDBI, IFCI, ICICI, LIC, TII, FCI, GIC, SICs and SIDUs.

2. Figures have been adjusted for inter-institutional inflows.

3. IDBI figures exclude overseas buyers' credit, subscriptions to shares and bonds of financial institutions, seed capital & guarantee, credit, preshipment credit, subscriptions to shares and bonds of financial institutions, seed capital & guarantee, population figures upto 1978-79 is based on the estimates by Directorate of Economics, Min. of Agri. and 1979-80, 1980-81 and cumulative figures are based on 1981 census.

PATTERNS OF INTER-REGIONAL INDUSTRIALISATION IN INDIA:
A RETESTING OF LINKAGE HYPOTHESES

Dinesh N. Awasthi

Paper presented in the Seminar on 'Development and Inter-regional Disparities in India' held at Sardar Patel Institute of Development Studies, Lucknow on 19-21 March '83.

Sardar Patel Institute of Economic and Social Research
Thaltej Road, Ahmedabad-54

Patterns of Inter-regional Industrialisation in India :
A Retesting of Linkage Hypothesis

Dinesh N. Awasthi*

Choice of 'balanced' or 'unbalanced' strategy of growth, with particular reference to an under-developed economy, has aroused a lot of controversy.¹ Though there still exist ambiguities regarding its definition,² balanced growth strategy, in general, refers to a 'wave of new investment in different branches of production simultaneously, (Rosentien Rodan 1943, Nurkse 1953, Lewis 1956) creating thereby more external economies and enlarging the markets through mutual support. Unbalanced growth strategy, on the contrary, involves a skewed pattern of investment where the sectors with high linkages take the lead. The role of inducing other (lagging) sectors to grow faster, is assigned to these leading sectors. (Rostow 1954, Hirschman 1958). The resources, therefore, are concentrated in a few sectors and the development process is seen as 'sequential'. (Hirschman p.78, 1961).

These two strategies of economic development have been generally considered mutually exclusive. This, however, has been questioned by some writers, who view these strategies as complimentary to each other. (Sen, 1960, Nath 1962, Bhatt 1965, Mathur 1966).

* Associated with Sardar Patel Institute of Economic and Social Research, Ahmedabad. The author gratefully acknowledges the valuable guidance given by Prof. S.P. Kashyap and Prof. G.V.S.N. Murty. Thanks are due to V.B. Tulasiidhar, Rakesh Basant and Jeemol Unni for their help and valuable comments on the earlier draft. Computer assistance provided by Shri Y.V. Pantulu is also thankfully acknowledged. Remaining errors in the paper are, however, the author's responsibility.

Attempts have been made to empirically test the viability of the hypotheses regarding the two growth strategies. Cross-section data for various countries and inter-temporal data for individual countries have been analysed for this purpose. The conclusions drawn by these studies, however, are contradictory and do not provide us with any consistent evidence in favour of either of the two strategies of growth. (Cheney and Watanabe 1958, Streeton 1959, Ohlin, 1959, Huges 1959, Dilip Swamy 1967, Chenery and Taylor 1968, Yotopoulos and Latu 1970).

In the studies quoted above, linkage effects either had no reference or only ^A passing one. It was Hirschman who suggested making the concept of linkages operational. Yotopoulos and Nugent (Y-N) (1973) were the first to evolve a method of measuring the linkage effect. This method made possible the testing of Hirschman's hypothesis : that the countries giving priority to the sectors having high linkages, will experience faster growth than countries not doing so. This study using data for various countries, concludes that the Hirschman's hypothesis in its pure form is not validated by the available evidence. A recent study (Panchmukhi, 1975) conducted on similar lines, exclusively for less developed countries, also concludes that the Hirschman's prescription has not stood the test in these countries.

The scope of the studies analysing these two strategies of growth has generally been limited to the comparisons across countries. Very few studies have analysed this question in the

inter-regional context. Studies of the latter kind may provide some insight into the development patterns across regions within a country.³

Studies by Gupta (1971) and Kashyap Desai (1974), however, do analyse the regional growth patterns in India with reference to the balanced - unbalanced growth strategies. Gupta (1971) using Chenery-Taylor (1968) frame-work concluded 'that the balanced growth does not contribute to rapid growth at all' (p.665). This study has been strongly challenged on technical grounds.⁴ Kashyap Desai's (K-D) study, adopting Y-N methodology, conclude that the Hirschman's hypothesis does not get support in the inter-regional frame' (p.149). These conclusions can also be questioned on some methodological grounds :

(a) The total linkage index defined in the study as,

$$L_{rj} = \sum_i A_{ij}^*, \text{ where } A_{ij}^* = (I - A_{ij})^{-1}$$

is misspecified. This index is supposed to indicate the actual linkages within the economy. Since some of the intermediate inputs are imported, $\sum_i A_{ij}^*$ also captures production linkages with other countries. This makes the index an erroneous measure of existing linkages within the country.⁵ Theoretically imports should have been netted out while constructing the total linkages index.

(b) Sectoral differences in the income elasticity of demand have also been ignored in this study. These elasticities would

play important role as '...supply is properly distributed among different commodities in accordance with consumer's want.Each industry must advance along an expansion path determined by the income elasticity of consumer demand for its product.'

(Nurkse, 1953, pp.250-51);

(c) The study uses employment in the census sector (ASI) for calculating growth rates and sectoral weights. Since changes in the factor intensity are likely to differ across the industries/states, taking employment as a proxy for output or value added generated in various sectors is likely to distort the results. Output or value added, therefore, we feel, is more appropriate, if conclusions are drawn on the basis of census sector alone.

In the light of the methodological issues raised above, this paper attempts a reinvestigation of the growth patterns observed across regions in India. This study analyses the period between 1970 and 1978.⁶ It is possible that the pattern of economic development, in response to the planning process initiated in the mid fifties, had not taken concrete shape by the early sixties (which is the period covered by the earlier study). Hence, an analysis of the latter period may be more meaningful.

The next section (II) discusses the methodology; section III presents the results and discusses their implications; some of the limitations of our study are spelled out in section IV. A brief summary is presented along with the major conclusions of the

study in the last section.

Section II - Methodology And Data Base

Linkages in an economy arise due to the technological relationship among its various sectors through their input purchase (backward linkages) and output disposal (forward linkages). Hence, if a sector with high linkages (backward and forward) is chosen as a key sector or priority sector, and more investment is made therein, it is assumed that it will induce growth impulses in other sectors too.

Thus the hypothesis to be tested here is that 'the region which complies with the Hirschman's (unbalanced) strategy of growth, by putting more stress on the high linkage sectors, grow at a higher rate than the region that do not.' The hypothesis would be validated by a significant positive correlation between the overall growth rate and Hirschman compliance indices (PH_i s).

Following Y-N(1973) frame-work, we define total linkage index (L_{ij}) for i^{th} region in j^{th} sector, as :

$$L_{ij} = \sum_i d_{ij}^*$$

where $d_{ij}^* = (I - d_{ij})^{-1}$

$$d_{ij} = a_{ij} - m_{ij}$$

and m_{ij} is per unit imported input requirement. (see table 1 for total linkages)

This linkage index is based exclusively on the matrix of domestic input coefficients,⁷ derived from Input-Output table (1979-80) of the Planning Commission used in the sixth plan.⁸ Here we may mention that national technology has been used as reference technology for various regions.⁹

The Hirschman Compliance Index (PH_i) is defined as region specific co-efficient of correlation (P) between L_{ij} and region specific sectoral growth rates (g_{ij}) :

$$PH_i = P(L_{ij}, g_{ij}) \quad \text{--- (1)}$$

An alternative formulation incorporating, the relative importance of a sector in a region (w_{ij}) and accounting for the sectoral differences in income elasticities of demand (E_j), is thus defined as :

$$PH_i^* = P(L_{ij} E_j, w_{ij} g_{ij}) \quad \text{--- (2)}$$

The balanced growth version of linkage hypothesis as suggested by Y-N(1973) is also tested at the regional level, since 'a sector grows differently from other sectors precisely due to existing differences in linkage indices - all the other factors appropriately weighted. This is the balanced growth version of the linkage hypothesis, which would predict that linkage-balanced countries should grow, over a long period, faster than linkage-unbalanced countries' (Y-N, 1973, p.167).

A linkage balance index for a region is defined as :

$$VL_i = \frac{1}{G_i} \sqrt{\frac{1}{n} \sum_{j=1}^n w_{ij} (g_{ij} - L_{ij} G_i)^2} \quad (3)$$

where n is no. of sectors and G_i the overall growth rate of the manufacturing sector in i^{th} region. w_{ij} is relative importance of sector j in i^{th} region (Value-added of j^{th} sector over total value-added of manufacturing sector of i^{th} region)

A further adjustment 'so as to account for difference in income elasticity of demand (E_j) between sectors may also be desirable'..... As such it might be said to combine elements of the structural change theories of Hirschman and Nurkse '(Y.N, 1973 pp. 168).

Thus the version of the indices, corrected for income elasticities, is defined as;

$$VL_i^* = \frac{1}{G_i} \sqrt{\frac{1}{n} \sum_{j=1}^n w_{ij} (g_{ij} - L_{ij} E_j G_i)^2} \quad (4)$$

Linkage balance indices calculated from equations 3 and 4 are reported in Table 2.

The VL_i index denotes the deviation of a region from the optimum linkage weighted growth proportions. The hypothesis, thus, will be validated by a negative correlation between the VL_i index and overall growth rates (G_i). The results are given in Table (3).

Data-Base

We have used value-added data (1970-1977-78), obtained from the Annual Survey of Industries, for factory sector/manufacturing sector (Census Sector + Sample Sector), to calculate growth rates and sectoral weights. Since the data is available at a very disaggregated level, we have aggregated it to match with the Input-Output table (1979-80), used for working out our linkages. Sectoral income elasticities estimated earlier have been used.¹⁰

Empirical findings of the study are being presented in the subsequent section.

(iii) Empirical Findings :

It can be seen from table - 3 that the Hirschman's Strategy in its pure form is not supported by the evidence. But the hypothesis is strongly vindicated when proper weights are assigned to the sectors according to their share in total value-added and sectoral income elasticities of demand also incorporated (as the results are positive and significant at 5% level of significance). However, looking at the Hirschman compliance indices at regional/state level, one observes low and negative values of PH_i , which indicates that many state have not followed Hirschman's prescription in its pure form (note that coeffi. corr. is insignificant in most of the cases).

The correlation between overall growth rates and linkage balance indices turns out to be negative and significant in all the cases. This is

so even when states like Himachal Pradesh and Jammu & Kashmir are omitted owing to their low level of industrialisation. Thus our results, like previous studies support the balanced growth version of the linkage hypothesis, in fact more strongly.

One observes, however, two main deviations in the findings, from the earlier study of Kashyap-Desai(1974). Unlike ^{the} previous study our results lend support to Hirschman's strategy even in its pure form (when weighted) in the regional context. A marked quantitative change is also noticed in the empirical findings of linkage balanced version. Our results are negative and significant^{mostly} at one per cent level of significance.

The difference in the results may be due to the differences in the coverage of data and the definition of the linkage index. Our study used data pertaining to both census and the sample sectors of the ASI., while Kashyap-Desai study is based only on the census sector data. The Linkage index in our study is based exclusively on the domestic production coefficients. This netting out of the import component of the production linkages is not done in the earlier study. The introduction of income elasticities of demand might also have effected the results. We have already pointed out that our study refers to the seventies (1970 to 1977-78) whereas the earlier study covers only early sixties (1960-65). This could also have led to the differences in the results due to reasons mentioned earlier.

Available evidence also suggests that the Hirschman's unbalanced growth strategy of development followed at the national level. It is a well known fact that following Mahalanobis¹¹ model, investments were concentrated in the basic and capital goods sectors (or key sectors) in the early phase of Indian Planning.¹² It would seem, therefore, that a variant of the unbalanced growth strategy was adopted in India by creating initially unutilized capacity (Panchmukhi, 1975) in the key sectors which in turn induced investment in other sectors which had forward¹³ or/and backward linkages with those key sectors.

It is likely that this pattern of investment made possible ~~the~~ achievement of balances within the states. The inequalities in the levels of industrialization across the states have been declining (Udaiskhar 1982, K.R.G. Nair, 1982). This may have been only due to the concentration of public investment in the backward states as a matter of policy.

IV. Limitations of the Study

The limitations of the input-output approach may constrain the adequacy of our exercise. Since input-output coefficients are specified in value terms, the relative regional price differences may create some distortions in the measurement of indices. The use of national technology as reference technology for the regional mapping also has certain limitations. Since the linkage structure and potential of an industrial activity may not be uniform over space, the use of region specific Input-Output tables is more appropriate in the exercises of the kind attempted here.

But the non-availability of comparable input-output tables at regional level leaves us with no option but ~~to~~ use the reference technology. Similarly, use of region specific sectoral income elasticities of demand may be more desirable, theoretically. However, imposition of the country level elasticities on the regions is not likely to alter the picture in this type of studies, to any significant extent.

Another underlying assumption of our study is that the states are more or less autonomous economic entities. This may not be the case. This assumption, therefore, creates problems ~~like~~ the ones created by the inclusion of the import component in cross-country studies.

The problems can be taken care of to a considerable extent if the following information is available :

- (a) A highly disaggregated statewise Input-output tables comparable from the point of view of sectoral definitions, and year of reference,
- (b) data pertaining to inter-regional trade; and
- (c) region specific sectoral income elasticities of demand.

Our exercise is analytically inadequate in the absence of this information. In the following section we summarise our findings and conclude the paper.

Summary and Conclusions :

An important objective of my growth strategy is not to achieve higher but maximum attainable rate of growth. Keeping this objective in view, two alternative approaches have been suggested time and again. One approach advocates balanced growth as an instrument to achieve the optimum growth whereas the other suggests unbalance strategy to achieve the desired rate of growth. As is clear from the earlier discussion, both the approaches are complimentary to each other.

In India's case, however, we infer that the relatively higher rate of growth has been achieved through adopting the latter approach in which linkages have played a leading role. This is not to say, however, that the linkages should be the sole criterion for deciding the investment pattern. Issues pertaining to equity, employment and self-reliance are also of paramount importance. These policy issues have to be and must be taken into consideration while evolving a planning strategy (Panchmukhi, 1975, pp.130). It is, in fact, very difficult to point out precisely the factors which shape the planning strategy. Institutional factors like income distribution, (propensity to consume and save) and most importantly the composition of the decision making body may play a crucial role in planning. These aspects may often overrule the consideration involved in linkages while formulating the policy. Some of the writers even feel that the linkages themselves may be institutionally determined. (Raj 1975).

However, inspite of how linkages are determined, one may argue that they are of immense use for policy makers and planners alike, in any process of rational economic planning.

TABLE - 1Industry wise Total Linkage Indices (L^i_j)

| Sector No. | Name of the sector | L^i_j |
|------------|--|---------|
| 1. | Milk and Milk Products | 1.5257 |
| 2. | Misc Food Products | 2.2823 |
| 3. | Sugar | 2.0557 |
| 4. | Gur and Khandsari | 2.1743 |
| 5. | Vanaspati | 2.1812 |
| 6. | Edible Oils | 1.8244 |
| 7. | Tea and Coffee | 2.0345 |
| 8. | Other Beverages | 1.8750 |
| 9. | Tobacco Manufacturing | 1.8991 |
| 10. | Cotton Textile | 2.0331 |
| 11. | Cotton Textile (Handloom Khadi) | 2.2780 |
| 12. | Woollen and Silk Textile | 2.2555 |
| 13. | Art Silk Fabrics | 1.5661 |
| 14. | Jute Textiles | 2.4507 |
| 15. | Readymade Garments | 1.7166 |
| 16. | Misc. Textile Products | 1.8613 |
| 17. | Carpet weaving | 1.2173 |
| 18. | Wood Products | 1.6521 |
| 19. | Paper, Paper Products and News print | 2.0973 |
| 20. | Printing and Publishing | 1.8111 |
| 21. | Leather and leather products | 2.3087 |
| 22. | Leather Footwear | 1.3930 |
| 23. | Rubber Products | 2.0935 |
| 24. | Plastics | 1.7929 |
| 25. | Petroleum Products | 1.0678 |
| 26. | Misc. Coal and Petroleum Products | 1.8969 |
| 27. | Organic and Inorganic Heavy Chemicals | 1.5214 |
| 28. | Chemical Fertilizer, Insecticides, Fungicides and Pesticides | 2.0533 |
| 29. | Drugs and Pharmaceuticals | 2.1033 |
| 30. | Soaps, Glycerine and cosmetics | 2.2151 |
| 31. | Synthetic Rubber, Manmade Fibers and other Chemicals | 1.8910 |
| 32. | Refractories | 1.7927 |
| 33. | Cement | 2.0576 |
| 34. | Other non-metallic Products | 1.9369 |
| 35. | Iron and Steel | 2.0403 |

(Contd....)

TABLE - 1 (....Contd)

| Sector No. | Name of the sector | Lij |
|------------|---|--------|
| 36. | Casting and Forging | 1.7245 |
| 37. | Iron and Steel Structures | 1.6646 |
| 38. | Non- Ferrous Metals | 1.7800 |
| 39. | Metal Products | 1.6610 |
| 40. | Tractors and Agricultural Implants | 1.5740 |
| 41. | Machine Tools | 2.0369 |
| 42. | Office, Domestic, and Comm. Equipments | 1.6546 |
| 43. | Other Non-electrical Machinery | 1.7757 |
| 44. | Electric Motors | 2.3049 |
| 45. | Electric cables and Wires | 2.2052 |
| 46. | Batteries | 1.6188 |
| 47. | Electric Household Goods | 1.8131 |
| 48. | Communication and Electronic Equipments | 2.0305 |
| 49. | Other Electrical Machinery | 1.7190 |
| 50. | Ships and Boats | 1.7755 |
| 51. | Rail Equipments | 2.1825 |
| 52. | Motor Vehicles | 2.1003 |
| 53. | Motor cycles, cycles etc. | 1.8781 |
| 54. | Other Transport Equipments | 1.9546 |
| 55. | Watches and Clocks | 1.5455 |
| 56. | Misc. Manufacturing | 1.6235 |

TABLE 2

Statewise - Growth Rates, Hirschman compliance Indices
and Balance Balance Indices
(1970-1977-78)

| States | Annual compound growth Rates Value Added (At 1977-78 Prices) | PHi | P [*] Hi | VLi | V [*] Li |
|------------------|--|---------|-------------------|--------|-------------------|
| Andhra Pradesh | 7.0712 | 0.1330 | -0.0971 | 0.4949 | 0.5244 |
| Assam | 9.9234 | -0.2575 | 0.2231 | 0.2208 | 0.3394 |
| Bihar | 3.2316 | 0.0224 | -0.2860 | 0.9180 | 0.8989 |
| Gujarat | 6.1602 | 0.0187 | -0.0175 | 0.4018 | 0.5234 |
| Haryana | 5.5721 | -0.0520 | -0.2323 | 0.4186 | 0.6696 |
| Himachal Pradesh | 5.8010 | 0.3909 | -0.2944 | 0.7148 | 0.2310 |
| Jammu & Kashmir | 7.6601 | -0.5608 | 0.1441 | 0.4154 | 0.6729 |
| Karnataka | 3.0938 | 0.3018 | -0.0096 | 0.4937 | 0.6631 |
| Kerala | 5.2412 | -0.0836 | -0.0954 | 0.4458 | 0.5006 |
| Madhya Pradesh | 6.8512 | .1434 | -0.0716 | 0.2758 | 0.3251 |
| Maharashtra | 3.6808 | 0.2088 | -0.0765 | 0.4227 | 0.4939 |
| Orissa | 7.1810 | -0.1083 | 0.2400 | 0.3112 | 0.4206 |
| Punjab | 6.2641 | 0.1194 | -0.2287 | 0.2325 | 0.3397 |
| Rajasthan | 2.5311 | 0.0169 | -0.1992 | 1.4113 | 1.4680 |
| Tamil Nadu | 4.2806 | -0.2511 | -0.1880 | 0.3715 | 0.4838 |
| Uttar Pradesh | 2.8222 | 0.1323 | 0.0380 | 0.9486 | 1.1145 |
| West Bengal | 1.9234 | 0.0432 | -0.1065 | 0.7676 | 0.7562 |
| Delhi | 2.0817 | 0.1020 | -0.1066 | 1.2856 | 1.3990 |

TABLE - 3

Correlation Coefficient (P) Between Linkage Indices
Overall And Growth Rates of the States (1970-78)

| Correlation Form | Values of Coefficient Correlation (P) | | | (a) Kashyap - Desai All States J&K and Orissa Omitted |
|-------------------------------------|---------------------------------------|------------|---------|--|
| | All States | H.P. & J&K | Omitted | |
| | | | | |
| <u>Birsell's Compliance Indices</u> | | | | |
| (i) P (Gi , PHI) | -0.4179*** | -0.4306*** | 0.0079 | -0.1169 |
| (ii) P (Gi , PHI *) | +0.4760** | +0.4366** | -0.1934 | -0.2462 |
| <u>Linkage Balance Indices-(N)</u> | | | | |
| (i) P (Gi , VLI) | -0.7307* | -0.7617* | -0.2046 | -0.4593*** |
| (ii) P (Gi , VLI *) | -0.5259** | -0.7350* | | |

Note : (i) * Significant at 1% level of Significance
 ** Significant at 5% level of Significance
 *** Significant at 10% level of Significance
 (ii) (a) Kashyap - Desai's Values have been shown for the purpose of comparison, which were taken from their paper (1971), Table 4.

NOTES

1. For detailed survey of literature on the controversy of Balanced Vs Unbalanced growth, please refer to Blitz (1959), Ohlin (1959) Theodore (1959); Pastore (1963), Prasad (1966), Mathur (1966).
2. For various interpretations of the definition of 'balanced growth' please see Singer (1958) Kindleberger (1966).
3. Studies available in this direction are by Gupta (1971) and Kashyap and Desai (1974), Jameson (1975).
4. For detailed comments please see : Demery and Demery (1972).
5. The Propriety of using exclusively domestic technology for constructing linkage indices was pointed out by Riedel (1976).
6. Choice of base year (1970) is due to the economic stagnation during 1966-1969 (though a controversy, we have avoided it at the moment).
7. Domestic coefficients were arrived at by deducting import transactions (Table 4.9) from the flow matrix (Table 4.3) obtained from the Input-Output tables used in sixth Plan.
8. Source of the tables mentioned above is 'A technical Note on the Sixth Plan of India' (1980-85), published by the Planning Commission, Govt. of India.
9. Use of a reference technology has also been suggested by Leontief (1966), Alagh (1971) and Lakdawala et al (1972). It may not be very desirable to use national technology as reference technology for regional mapping, however, it is not very undesirable too, given the circumstances.
10. The underlying assumption in using country's sectoral income elasticities of demand for the regions/states, is, that the elasticities do not vary much across the states as far as manufacturing is concerned. This difference may be more noticeable across rural and urban areas or across the two population groups, i.e., people below or above poverty line. We have taken care of these differences while working out sectoral income elasticities of demand (E_{js}) (Awasthi, 1983).
11. See Mahalanobis (1955) in this particular reference.
12. A passage from the Second Five Year Plan also reads that 'There cannot be a complete balance between the developments in each five year plans; to some extent, a measure of imbalance - seeming over expansion in some lines and under expansion in others may facilitate more rapid and better balanced development over a period. Considerations of this kind apply particularly to sectors like development of power, transport and basic industries (emphasis added) where investments are by nature "lumpy". Second Five Year Plan, 1956, Planning Commission, Govt. of India, (p.17).

REFERENCE

1. Alagh, Yoginder K. (1972), "Regional Aspect of Indian Industrialization", University of Bombay.
2. Awasthi, Dinesh N. (1983), "Sectoral Income Elasticities for the Indian Economy : Estimates for 1977-78". Paper presented in 21st Annual Conference of the Indian Econometric Society, Jan 10-12, 1983 at Annamalai University, Chidambaram.
3. Bhatt, V.V. (1965) "Some Notes on Balanced and Unbalanced Growth", The Economic Journal, No.297 (March), Vol. LXXV.
4. Blitz, Rudolph C. (1959), "Balanced growth in History: A Critique", Comments, American Economic Review - Paper and Proceedings, (May), Vol. 49, No.2.
5. Chenery, H.B. and Taylor, L.J. (1968), "Development Patterns : Among Countries and Over Time", Review of Economics and Statistics, Vol. 5, (Nov.).
6. Chenery, H.B. and Watanabe, T. (1958), "International Comparison of the Structure of Production", Econometrica, Vol.26 (Oct.)
7. Demery, David and Demery, Lionel (1972). "A note on Inter-regional Development Patterns", The Indian Economic Journal, No.20 (Oct.-Dec.).
8. Gupta, K.L. (1971), "Development Patterns : An Inter-regional Study" Quarterly Journal of Economics No.85 (Nov.).
9. Hirschman, A.O. (1958, 1961) "The Strategy of Economic Development", New Haven : Yale University Press.
10. Huges, J.R.T. (1959), "Foreign Trade and Balanced Growth : The Historical Framework", American Economic Review - Paper and Proceedings, Vol.49, (May), No.2.
11. Jameson, K. (1975), "Development Patterns and Regional Imbalances in Brazil", The Review of Economics and Statistics, Vol. LVII (Aug.) No.3.
12. Kashyap, S.P. and Desai, R.D. (1974), "Hirschman's Linkage Hypothesis : A Regional Test", The Indian Journal of Labour Economics, Vol.77, (Oct.-Jan.) No.3-4.
13. Kindleberger, C.P. (1965), "Economic Development", Tokyo; Kogakusha (McGraw-Hill). Ch. 13.
14. Lakdawala, D.T. Alagh, Y.K., Sarma, A. (1972), "Regional Variations in Industrial Development" Sardar Patel Institute of Economic and Social Research, Ahmedabad.

15. Leontief, W.W. (1966), "Input-Output Economics", New York, Oxford.
16. Lewis, W.A. (1956), "Theory of Economic Growth" London. Allen & Unwin
17. Mahalanobis, P.C. (1955) "The Approach of Operational Research to Planning in India", Sankhya, Vol. 15 (Dec.) No.5.
18. Mathur, A. (1966), "Balanced vs. Unbalanced Growth - A Reconciliatory View", Oxford Economic Papers, Vol. 18 (July) No.2
19. Nair, K.R.G. (1982), "Regional experience in a Developing Economy", New Delhi, Wiley Eastern Ltd.,
20. Nath, S.K. (1962), "The Theory of Balanced Growth", Oxford Economic Papers, Vol. 14, (June) No.2.
21. Nurkse, R. (1953), "Problems of Capital Formation in Underdeveloped Countries", New York : Oxford University Press.
22. Ohlin, B.C. (1959), "Balanced Economic Growth in History", American Economic Review - Papers and Proceedings, Vol.49 (May).
23. Panchmukhi, V.R. (1975), "Linkages in Industrialisation : A Study of Selected Developing Countries in Asia", Journal of Development Planning, No.8, United Nations, New York.
24. Pastore, J.M.D. (1965), "Balanced Growth : An Interpretation", Oxford Economic Papers, Vol.15, (July), No.2.
25. Prasad, K.N. (1966), "The Balanced Versus Unbalanced Growth Controversy - A Critical Survey", The Indian Economic Journal, Vol.14, (Oct. Dec.), No.1.
26. R. K.N. (1975), "Linkages in Industrialisation and Development Strategy : Some Basic Themes", Journal of Development Planning, No.8, United Nations, New York.
27. Riegel, James (1976). "A Balanced Growth Version of Linkage Hypothesis : A Comment". Quarterly Journal of Economics, Vol.90, (May), No.2.
28. Rosestien-Rodan, P.N.(1943), "Problems of Industrialisation of East and South-Eastern Europe", Economic Journal.
29. Rostow, W.W.(1954), "Trends in the Allocation of Economic Resources in Secular Growth" in Leon H. Dupriez (ed.) "Economic Progress", Proceedings of the International Economic Association's Annual Conference. Also see his (ed.) "Take-off into self-sustained Growth", Macmillan, Particularly the first article on 'Leading Sectors and the take-off', (1963).
30. Sen, A.K. (1960), In the review of 'The Strategies of Economic Development' The Economic Journal, Vol. LXX, (Sept) No.279, pp.590-593.

31. Singer, H. (1958), "The Concept of Balanced Growth In Economic Development - Theory and Practice". Malayan Economic Review, (Oct.).
32. Streeton, P. (1959), "Unbalanced Growth", Oxford Economic Papers, No.11 (June).
33. Swamy, D. (1967), 'Statistical Evidence of Balanced and Unbalanced Growth", Review of Economic and Statistics, Vol.49 (Aug.) No.3.
34. Theodore, M. (1959), "Balanced Growth in History : A Critique : Discussion", American Economic Review - Papers and Proceedings, Vol. 49, (May).
35. Udaishekhar, A. (1982), "Trends in Inter-State Disparities in Industrial Development In India, 1961-1975", The Indian Economic Journal, Vol.30, (Oct.-Dec.), No.2
36. Yotopoulos, P.A. and Lau, L.J. (1970), "A Test for Balanced and Unbalanced Growth", Review of Economics and Statistics, Vol.52, (Nov.)
37. Yotopoulos, P.A. and Nussent, J.B. (1973)", A Balanced Growth Version of the Linkage Hypothesis : A Test", Quarterly Journal of Economics, Vol.57, (May).

INTER-REGIONAL INDUSTRIAL DISPARITIES IN INDIA

Brijesh K. Bajpai*

In the process of planned development in India, the pre-occupied regions of industrial activities - the coastal regions, could achieve a better pace of industrial development. In course of industrial expansion, as per empirical evidences, regions equipped with industrial infrastructural facilities have further induced the entrepreneurs to concentrate their activities in these regions. These trends have created an agglomeration of industrial units in already developed areas. As a result of this process biased industrial background proved a major hurdle in the way of steady industrial development of the country. Over a period of 33 years of planned economy numerous priorities have been given to industrially backward regions for initiating the process of industrial diversification and spread of industries in them. In spite of these efforts, vast differences continue to persist among states in terms of their industrial potentials - capacity utilization, efficiency, magnitude of industrial licencing and industrial harmony etc. A number of factors are responsible for these disparities. An attempt has been made here to analyse the existing industrial

*Giri Institute of Development Studies, B-42, Nirala Nagar, Lucknow.

disparities and to find out the causes and remedies for predicament.

HISTORICAL RETROSPECT

The industrialisation in India took place in a century prior to its independence. Important industries have come up in the eastern western and southern coastal regions. Even in these regions areas close to harbours have attracted more industries by facilitating trading of goods. Agglomeration of industrial units at such places have further generated external economies which attracted more investment in the regions. Before independence industries were mainly disproportionately concentrated in Bombay and Calcutta. "The dominant share of these two centres is reflected by the fact that in 1951 they accounted for 42 per cent of the total registered factory employment and represented 67 per cent of the entire paid up capital of manufacturing industry and that they contributed 50 per cent of the total output of manufacturing. Even more striking is the fact that these two regions with 12 per cent of total urban population accounted for 63 per cent of the total industrial workers."¹ An increasing trend of industrial development in these regions has been the sole cause of hampering the industrial growth of the other regions. Considering the unbalanced development of industrial structure and to bring about desirable balance and diversification, for the first time, issue of regional disparities was taken under second industrial policy resolution of 1956. The resolution stressed

necessity of reducing the regional disparities in levels of development in order that industrialisation may benefit the country as a whole. The resolution fully supported the idea that only by securing a balanced and co-ordinated development of the industrial economy in each region, can the entire country attain higher standards of living.

REDUCING REGIONAL INDUSTRIAL DISPARITIES THROUGH PLANS

The first plan did not refer to the problem of regional disparities. The second plan admitted that "in any comprehensive plan of development, it is axiomatic that special needs of the less developed areas should receive due attention. The pattern of investment must be so devised as to lead to balanced regional development."² The Third Plan programmes were so prepared as to "reduce disparities of development between different states, although in the nature of things, this is a process which must take time. "The third plan, included scheme "to enlarge the possibilities of development in areas which have in the past been relatively backward."³ The Second and Third Plans streamlined the necessity to locate basic industries in less developed areas subject, of course, to technical and economic limitations, as means of achieving regional development. In successive Five Year Plans the planning commission has sought to tackle the problem of regional industrial disparities in various ways, as outlined below:-

1. Under the Income-tax Act a portion of the projects of new undertakings setup in backward areas, is exempted from tax.

2. The central Government has been encouraging private enterprise to be located in specific backward regions through an investment subsidy.
3. State governments have offered incentives to attract private sector units to the backward regions through SFCs, SIDCO and SIICs under the schemes of concessional finance. Apart from State governments efforts, concessional finance is being offered by term-lending institutions IDBI, IFCI and ICICI etc. to industrial projects located in the backward areas.
4. The Finance Commission in India have used backwardness of a state as one of the criteria for the transfer of funds from central pool to the states. In the Gadgil formula 10 per cent of the central assistance is for those states whose per capita income is lower than the National average. Under the new I.A.T.P. formula the low income states are given preference since the per capita transfer is proportionate to the increase of the per capita income.

Under the implementation of industrial policy announced on December 23, 1977, "The main thrust of the policy was the promotion of small and cottage industries, the dispersal of industries away from the large metropolitan areas and simplification of licensing procedures. The industrial policy envisaged the setting up of District Industries Centres in a phased manner in order to promote widely dispersed development of cottage and small scale industries in rural areas and small towns."⁴

"Government's new industrial policy was announced in July 1980. While reiterating the basic industrial policy framework of 1956. The new policy has several notable features. In pursuance of the new policy, steps were taken to allow automatic expansion of production in industries, disperse industries with a view to achieving balanced regional development and de-urbanise through encouraging the growth of village and small scale industries in coordination with bigger units."⁵

In our Sixth Five Year Plan⁶ (1980-85) the problem of regional industrial disparities has been considered very seriously. The National Committee on Development of Backward Areas (NCDBA) has been formed to bring about progressive reduction in regional inequalities and to defuse the technological benefits through the formulation of a successful policy for balanced industrial development. The committee has recommended a policy of encouraging location of industry in suitable growth centres with due weightage on such centres in industrially backward states. The committee has suggested establishment of an Industrial Development Authority in such selected centres which will work on a commercial basis to provide necessary infrastructure and to channel development funds which might be allocated by central or State governments. The Authority will provide a masterplan on the basis of which financial institutions would be able to assist development of the area. The committee has also made recommendations regarding modification of some of the existing schemes of incentives.

STATE OF INDUSTRIAL DISPARITIES

In early stages of planned development programmes in India our major objective was to attain higher level of economic development. Hence the scarcity of resources and productivity of investment made it imperative for the decision makers to invest only in those sectors of the economy or those regions of the country where the rate of return was expected to be the greatest. This led to the concentration of large and medium

scale units at urban industrial centres(Agglomerates). At the close of Third Five Year Plan it was realised that as a result of previous strategy there were appreciable gains in aggregative terms but development in general and industrial development in particular had become lopsided and inter-regional disparities accentuated to an alarming situation. In order, therefore, to initiate the path of balanced regional development in the field of industrial sector, a national programme for industrialisation of backward areas was launched in different states during 1969. Besides laying emphasis on industrial estates and industrial complexes programmes, we also started numerous incentives schemes (central subsidy, transport subsidy, concessional finance etc.) to attract entrepreneurs to set up industrial units in industrially backward areas. We had also done restructuring at the district level by setting up District Industries Centres' through out the country so as to ensure prompt delivery of services to entrepreneurs and for better performance of the district level functionaries.

The changes brought about in strategy of development around seventy are expected to have brought about favourable impact on reducing inter-regional disparities in levels of industrial development. It, therefore, becomes relevant to examine as to what extent these measures have proved to be effective in arresting industrial disparities. Analysis of the data relating to per capita industrial output for 16 states suggests that the magnitude of inter-regional disparities in industrial development which was 73 per cent (in terms of

co-efficient of variation) in 1969 reduced to 67 per cent during 1977. Secondly, the range between the states of the highest and the lowest ratios which stood at 245.31 in 1969 also decreased to 238.27 during 1977 as would be evident from the following table. An interesting part of the analysis is that the states of Maharashtra, West Bengal, Haryana, Gujarat and Tamil Nadu which could be designated as industrially developed states in 1969 are also found to have maintained their status quo during 1977 of per capita industrial output. The states falling in the latter two categories, had their ratios below the national average in 1969 are designated as the states of medium and low level of industrial development. None of them could exceed the national average even in 1977. The co-efficient of correlation of state-wise ratios of per capita industrial output between 1969 and 1977, which was significantly high (.95), provides some clue to infer that the initial inter-regional pattern of industrial development which existed in 1969 continued to persist during 1977, although three-fifth of the states brought about some improvements in their relative positions. A similar is the case with with states falling in medium and low levels of industrial development.

INDUSTRIAL DISPARITIES AND ASSOCIATED FACTORS

I. Industrial Licencing: There has been liberal policy for the promotion of the industrial development in backward regions, even in terms of the issuing of industrial licences and letters of intent, during 1979. But the top ranking states in

Relative Position of Different states in terms of
Per capita industrial output; 7

| States | Ratios of per capita industrial output (States) to India | | | |
|---------------------------------------|--|------|--------|------|
| | 1969 | | 1977 | |
| | Ratio | Rank | Ratio | Rank |
| A. High level of Development | | | | |
| 1. Maharashtra | 231.67 | 1 | 270.60 | 1 |
| 2. West Bengal | 193.55 | 2 | 133.36 | 5 |
| 3. Haryana | 177.44 | 3 | 139.19 | 4 |
| 4. Gujarat | 177.03 | 4 | 193.84 | 2 |
| 5. Tamil Nadu | 125.14 | 5 | 140.54 | 3 |
| B. Medium level of Development | | | | |
| 6. Punjab | 80.32 | 6 | 94.83 | 6 |
| 7. Kerala | 73.06 | 7 | 75.11 | 7 |
| 8. Karnataka | 72.95 | 8 | 74.43 | 8 |
| 9. Andhra Pradesh | 61.80 | 9 | 63.49 | 10 |
| C. Low level of Development | | | | |
| 10. Assam | 57.33 | 10 | 56.80 | 12 |
| 11. Bihar | 57.10 | 11 | 65.56 | 9 |
| 12. Madhya Pradesh | 54.70 | 12 | 59.31 | 11 |
| 13. Orissa | 52.72 | 13 | 43.11 | 13 |
| 14. Uttar Pradesh | 43.99 | 14 | 44.96 | 14 |
| 15. Himachal Pradesh | 36.36 | 15 | 32.33 | 16 |
| 16. Rajasthan | 35.19 | 16 | 43.67 | 15 |
| India | 100.00 | | 100.00 | |

Note:-

| | | |
|--------------------------------|-------|-------|
| Mean Value (\bar{x}) | 93.76 | 96.36 |
| S.D. (s) | 71.61 | 64.91 |
| Co-efficient of Variation (V) | .73 | .67 |
| Co-efficient of Correlation(r) | .98 | |

industrial development continue to remain in superior position. In the table given below, figures are showing the state-wise issue of industrial licences and letters of intent for the year 1979.

State-wise Numbers of Issued Industrial Licences
and Letters of intent during 1979³

| Sl. No. | States | No. of Industrial Licences Issued | Percentage of industrial licences issued | No. of Letters of intent issued | Percentage of letters of intent issued |
|------------|------------------|--|--|--|---|
| 1. | Maharashtra | 111 | 30.43 | 105 | 19.09 |
| 2. | West Bengal | 29 | 7.95 | 23 | 5.09 |
| 3. | Haryana | 16 | 4.33 | 26 | 4.75 |
| 4. | Gujarat | 40 | 13.15 | 118 | 21.45 |
| 5. | Tamil Nadu | 26 | 7.12 | 35 | 6.36 |
| 6. | Punjab | 13 | 3.56 | 26 | 4.73 |
| 7. | Kerala | 11 | 3.01 | 11 | 2.00 |
| 8. | Karnataka | 24 | 6.57 | 34 | 6.18 |
| 9. | Andhra Pradesh | 17 | 4.66 | 44 | 8.00 |
| 10. | Assam | 2 | 0.55 | - | - |
| 11. | Bihar | 3 | 0.82 | 5 | 0.91 |
| 12. | Madhya Pradesh | 7 | 1.92 | 34 | 6.18 |
| 13. | Orissa | 6 | 1.64 | 5 | 0.91 |
| 14. | Uttar Pradesh | 33 | 9.04 | 30 | 5.45 |
| 15. | Himachal Pradesh | 1 | 0.27 | 6 | 1.09 |
| 16. | Rajasthan | 8 | 2.19 | 35 | 6.36 |
| | Others | 10 | 2.74 | 8 | 1.45 |
| | Total | 365 | 100.00 | 550 | 100.00 |

The maximum number of licences and letters of intent, issued, were concentrated among five top ranking states. Out of the

total, 66.59 per cent licences and 56.74 per cent letters of intent were for the industries located or to be located in there five states viz., Maharashtra, West Bengal, Haryana, Gujarat and Tamil Nadu. As against this the states, representing medium level of industrial development, got 14.24 per cent of the total licences and 20.91 per cent of the total letters of intent issued during 1979. The states of Bihar, Uttar Pradesh, Madhya Pradesh and Rajasthan managed to get 13.97 per cent of the licences but 13.90 per cent of the letters of intent. The remaining industrially backward states could achieve nearly 5.20 per cent and 3.45 per cent of the total licences and letters of intent respectively. During 1979, 365 industrial licences and 550 letters of intent were issued.

II. Per Capita Financial Assistance:

Per capita assistance received through financial institutions is also an indicator to show industrial disparities among the regions. The Gujarat and Maharashtra which form the Western zone along with Goa have had highest per capita assistance. During the 1979-80, for as many as 16 states, the per capita assistance by financial institutions fell below the national average of Rs.28.42. Gujarat and Maharashtra received per capita assistance from these institutions to the tune of Rs. 38.20 and 62.08 respectively. As against these, Kerala received Rs.33.34, Punjab Rs.37.41 and Tamil Nadu Rs.31.43. West Bengal received Rs.23.30 and Orissa Rs.9.90 only. The lowest share was received by Assam Rs.3.90 only.

III. IDBI'S ASSISTANCE AGAINST REGIONAL IMBALANCES:

The Parliamentary committee on Public undertakings has criticised the Industrial Development Bank of India for 'Pronounced regional imbalances' in rendering assistance. For instance, it pointed out the share of North-eastern region in IDBI's aid is almost negligible about one per cent, while industrially developed Maharashtra and Gujarat account for 32 per cent of the total aid of Rs.5,391 crores given by IDBI in the past 16 years. Even aid to backward areas was imbalanced the top 50 out of 247 such areas accounted for the bulk of aid given. Their share ranged from 69 per cent to 85 per cent.

A number of other indicators can be inumerated for depiction of the industrial disparities among the regions. Going through in detail we may get vast differences in terms of industrial-growth-rate capacity utilization and availability of infrastructural facilities among regions. The backward areas in the already developed regions also receive a greater proportion of official assistance than the backward areas in the developing regions.

CAUSES OF INDUSTRIAL DISPARITIES

Existing state of industrial disparities may be categorised under two heads. First, the disparities caused by the production inefficiency, negligence and shortage of raw material in backward regions. Second, the disparities due to better industrial performance and proper resource utilisation for industrial production in industrially advanced regions. Thus the joint

effect of negative and positive industrial performances magnify the tone of disparity. Attention should be given to the regions of inferior industrial performance and causes of deficiency should be found out. Industrially developed states are also matter of concern to the extent they develop at the cost of backward states.

In course of development of industrially backward states, the impact of concessions and incentives made available to the units in the regions, has not so far been significant. The reasons being either the programmes of developing industries in these regions not pursued vigorously or the entrepreneurs did not find incentives and concessions attractive enough to locate their units in the backward regions.

In order to create a better opportunity structure for industrial development, state governments had decided to establish industrial estates and industrial complexes, but the same could not help to promote the industrial development of backward regions because comparatively larger number of industrial estates and complexes were established in developed regions than backward ones. These infrastructural gaps have led to significant variations in growth rates of output and employment between developed and backward regions.

Very recently the President of I.C.C. Mr.B.D. Banguar has expressed his opinion⁹ that lack of any aggressive industrial policy is responsible for slow industrial growth in the Eastern region. A notable change in the industrial process over the

years had been the slow growth rate of the eastern region as compared to other regions in the country. The eastern region had lost its premier position despite having a vast pool of natural endowments and technical man-power. Between 1951-1973, the share of the eastern region in the net industrial output had declined from 36.9 per cent to 21.5 per cent, whereas that of western region and southern region had increased from 33.1 per cent to 37.2 per cent and from 17.2 per cent to 24.2 per cent respectively. The eastern region in 1973 accounted for 8 per cent of the net output of the chemicals and chemical product industries as against 66 per cent of the western region. Shortage of power, both in terms of additional installed capacity and electricity generation had crippled industrial production in this region, land was not available for setting up new industries. One of the main reasons for the failure of industrial entrepreneurship in the eastern region is the governments' reluctance towards the development of industrial infrastructural facilities. Prevalence of large number of multinational houses, mostly from the developed part of the Europe have further reduced the scope of indigenous industries in the region.

As it has been described in the beginning States like Maharashtra, Gujarat and Goa have enjoyed historical advantage in term of location of industries in the region, their position have further been strengthened by attitude of the governments of the region through developing their states industrially. The well-developed infrastructure in the form of railways,

ports, power generation etc. has further helped this region to attain a very high rate of industrial growth.

Another reason for high growth rate in Gujarat and Maharashtra is that both the states have been maintaining political peace and stability in the sense that for the past three decades the same party has been ruling the state as at the centre. This enabled these two states to establish necessary rapport with the centre which relatively settled the problems in a constructive way.

Industrially developed states are making exclusive efforts for their industrial development incomparision to other industrially backward or developing states. For instance the Gujarat government allocated Rs.455 crores to carry out a massive industrial research and development programme in the Sixth Plan. This is to fulfil the requirements of the rapidly growing industrial sector in the State. The efforts of Western region for the development of industrial potential can be emagined from the fact that their power generation capacity is far above than Eastern region. Which is very close to the source of coal supply.

Remedial measures

Industrialisation is a better way than others to develop backward regions mainly on two counts. Firstly, industrial activities are expected to be less inflexible in their choice of location then agriculture and other fixed-factor dominated activities. Therefore industrial development is possible

even in the areas with poor natural endowments. Secondly, industrial activities are supposed to have a relatively better potential of acting as a catalyst of both backward and forward linkages. These two basic characteristics of industrial activities present enough evidence of the possibility of industrial development even in backward regions. Vigorous efforts are being made to promote industrial development in backward regions to abridge disparities. But for the balanced dispersal of industrial activities, endeavours are not properly made and operational faults exist there.

In our industrial licensing policy dispersal of industrial units in backward regions was an important objective. But the desired level of industrial licensing in backward regions could not be achieved due to operational faults. It has also been realised by the National Committee on the Development of Backward Areas that licensing policy is a negative instrument and can not by itself promote industrial development in industrially backward areas. It can, at most, impose certain restraints on the pace of expansion in developed areas and thereby make it easier to attract entrepreneurs to industrially backward areas.

Facility of aid concessional finance for industrial development are being availed mainly by developed regions. Provisions should be made to divert the flow of concessions and aids towards backward regions. In this connection, suggestion of National Committee on Development of Backward Areas should

be implemented. Committee has stressed that financial concessions and aids should be restricted only to areas which are not "near" existing industrial centres. For this purpose, "existing industrial centres" and proximity has been defined.

Most of the industrially backward regions lacking absorptive capacity relating to fiscal concessions and financial aid-the same being led by negation of proper infrastructural facilities for industrial development, could not avail the aforesaid concessions. The actual requirements in these regions call for, at the outset, the development of infrastructure like transport and marketing services. Financial instruments may prove to be effective still in a situation involving minimum infrastructure for industrially backward regions. In such regions priority should be given to the development of infrastructure to attain an industrial structure in a diversified manner so that with higher potential of linkage and required level of industrial development, a large amount of financial assistance and other incentives could be observed. The industrially backward states would thus come up as a result of management of available facilities in proper seriatum to the extent of reduction in industrial disparity.

The employment generating industries should be promoted to further the cause of industrial employment in backward regions. It has been a marked tendency during the years that the facilities of concessional finance (investment subsidy) has gone to the industries which have not shown significant employment potential.¹⁰ On the other hand, industrial units, which have

contributed to employment growth have not been important beneficiaries of concessional finance.¹¹ So it is to be kept in mind while making available the financial facilities to the industrially backward areas that the substantial share of concessional finance reaches the employment generating industries (though Dandekar Committee has not recommended this) as they also help in the establishment of other units within the region by supplying the trained workers, entrepreneurs or technical and financial help along with creation of direct employment.

Apart from above stated measures to reduce the regional industrial disparities, it is also necessary to develop a minimum threshold level of industrial activity preferably with strong inter-relationship among industries.¹² This burden can not be shouldered only by financial institutions. An organisation having representatives of the financial institutions, promotional institutions, state administration, and potential industrial entrepreneurs may be required for such planning for each of the backward regions. This also seems necessary with a view to ensure supply of other inputs, such as, fuel and power, raw material and marketing, which features as more important constraint than finance in the development of backward areas. On the same lines National Committee on the Development of Backward Areas suggested that industrial policy should encourage the location of industry in suitable growth centres with due weightage for such centres in the states which are industrially backward. Measures involving adequate implementation of industrial dispersal policies and their pursuasion would, in due course, bring about reduction in industrial disparities.

References

1. S.C. Kuchal, (1969), The Industrial Economy in India, Allahabad, p.223.
2. Second Five Year Plan (Draft).
3. Third Five Year Plan (Draft).
4. Economic Survey, 1978-79.
5. Economic Survey, 1980-81.
6. Sixth Five Year Plan (1980-85).
7. Statistical Abstract of India, 1973 and 1979. (Ratios are derived from ex-factory value of industrial output).
8. Source: Ministry of Industrial Development.
9. Economic Times, February 4, 1983.
- 10, 11,
& 12. T.S. Papola, R.T. Tewari, (1981), Impact of Concessional Finance on Industrial Development of Backward Areas, Giri Institute of Development Studies.
13. Report on Industrial Dispersal, National Committee on the Development of Backward Areas, 1980, Planning Commission, Government of India.

SM

THE REGIONAL PATTERN OF URBANISATION AND ECONOMIC DEVELOPMENT IN INDIA

Rakesh Mohan*

Introduction : Some Theoretical Background

Interest in the regional aspects of development has a long and respectable history. Disputes on the causes of as well as solutions to the existence of regional disparities have been at least of equally long standing. Economic development tends to be concentrated in certain geographic regions as development proceeds from low levels of income. Moreover, the obvious manifestation of concentration is in cities which tend to stand out in sharp contrast with their surrounding countryside. Agriculture also is often seen to prosper in certain regions more than in others. The combined effect of such emerging patterns is that disparities are observed on the one hand between urban and rural areas and on the other between regions. If agricultural prosperity is itself accompanied with higher urbanization the emerging regional differentials in income and welfare between regions are then even more clearly related to the differential rates of urbanisation. This paper is then an effort to relate the existing differentials in the levels and rates of urbanization between States to their levels of economic development.

*Senior Consultant, Perspective Planning, Planning Commission, New Delhi.

The views reflected in this paper are those of the author and should not be attributed to the Planning Commission. The author is grateful to M.K. Nanda for Programming assistance.

It is interesting that although concern with inter-regional disparities has been expressed in Indian plan documents for a long time and that one of the avowed aims of planning is to reduce their disparities there has been little attempt to relate their existence with differential rates of urbanization. Most of the concern with urbanization has been to do with the relative rates of growth in large and small cities. The reasons for this neglect are, perhaps, not hard to find. While there are respectable theories concerning the link of urbanisation with economic development, others to explain the growth of individual cities (e.g. economic base theory) and yet others to explain the distribution of towns in agricultural regions (e.g., central place theory), there is little available to link up these different strands to be able to explain the regional as well as size distribution of cities simultaneously. A recent advance in this direction has been made by Koichi Mera (1974) by positing what he terms the "layer" concept of urbanisation.

The tight link between levels of economic development and urbanisation is now well established as well as accepted. A logistic equation relating levels of per capita g.n.p. to levels of urbanisation, both measured traditionally, is found to fit international data quite well. Indeed, it is felt that the fit would be even better if there were not the inevitable measurement problems related to the definition of urban areas which varies between countries as well as the well known problems in the measurement of g.n.p. It is found that as income

increases urbanisation proceeds slowly in initial stages, then accelerates (in the stage of countries which are now known as middle income countries) and again slows down as very high levels of income are reached. This is found to be largely true for a cross section of countries at any given time and a time series for the same country over a period of time. The explanation for such a phenomenon can be stated in somewhat different ways. What is required is a framework for the whole economy and the place of urbanisation within it.

Consider an economy with the three traditional economic sectors : agriculture, industry and services. The production structure of these sectors can be modelled through the use of standard production functions. The returns to the factors of production - labour, capital and land - which interact to produce the output through these production functions can then be attributed to each. Once this is done, the demand arising for each of the three products arising from these income can be determined. Such a model can be simulated and the economy made to grow by adding rules of investment and saving. The results of such a model illustrate the typical path followed by an economy undergoing economic development and urbanisation. Agriculture is essentially located in rural areas and industry and services in urban areas. Initially, at low levels of income, the large majority of the labour force is employed in agriculture producing at subsistence levels. Trade between the urban and rural areas is determined essentially on the one hand by the demand for food by the small urban population and,

on the other, by the small demand for urban goods by the rural population. At low income levels, large proportions of income are spent on food while only the residual small amounts left are spent on urban goods. As incomes rise, perhaps as a result of technological change in agriculture, the proportion of income spent on food declines and consequently that on other goods increases. This is because after nutritional needs are satisfied only small increases can take place in the income spent on food: more technically this is the familiar Engel effect resulting from the income elasticity of food being less than one. In the initial stages, when the marginal increases in income are still going towards satisfaction of nutritional needs, the increase in demand for non-food goods is slow. Consequently, the increase in demand for labour to produce the non-food goods is also slow and hence that ^{of}/urbanisation. As incomes increase and the proportion of income spent on non-food goods continues to increase, the absolute demand for non-food goods accelerates, hence that for the demand for labour in urban areas and hence the rate of urbanisation accelerates as well. At very high income levels, the rate of urbanisation slows down again since there is a logical limit of 100 percent in any case and the proportion of labour force necessary to produce the food required for the urban areas approaches an irreducible minimum. This process can only happen when there is a continuing technological change in agriculture which permits continuing increases in labour productivity there.

Some caveats and explanations are in order in the above tale. This somewhat elaborate, though perhaps commonsensical explanation, has been given since it is often said that the relationship between urbanisation and economic development is only an observed regularity and not well-based in a theoretical sense. The main question which remains unanswered in such a formulation relates to the reasons why non-agricultural activities are located in urban areas in the first place. This also raises the question, not addressed until now, on what constitutes an urban area. Conceptually, disregarding details and practical problems characteristically encountered in the classification of urban areas by census authorities, the essence of urban areas lies in the (i) size of settlements; (ii) density of these settlements and (iii) predominance of non-agricultural activities. An urban area is essentially a settlement of some size with considerable density. The predominance of non-agricultural activities is actually a consequence of such a size and density of a settlement. Since agricultural activities are land intensive it is difficult for a large number of people engaged in agricultural activities to concentrate in one settlement. This is another way of saying that the elasticity of substitution between land and non-land inputs in agriculture is limited, while in industry and services it is high. As a result, industry and service activities are capital intensive and are therefore concentrated in space which leads to concentration of human population as

well. The other reason, though it is associated with the above is that industries and services exhibit scale economies as well as agglomeration economies much more than agriculture. The existence of industries exhibiting scale economies implies plants of certain optimal sizes which implies concentration. The labour employed by such a plant then requires associated services for consumption purposes. Similarly, the functioning of the plant requires other complementary services such as finance and banking. Moreover, complementary manufacturing facilities which provide inputs to the plant or which use as their inputs the plants' products find it profitable to locate near such a plant because of the existence of transport costs. Hence it is the combined operation of scale economies, agglomeration economies, the existence of transport costs and the comparatively higher non-land-land substitution elasticities in industry and services which make their location necessary in urban areas.

Koichi Mera's "layer" theory is similar to such a formulation attempting to explain the distribution of urbanisation. The agricultural sector's demand for non-food goods implies some urbanisation which results from agricultural activities themselves. This is Mera's first layer and also the basis of Christaller's "Central place theory". This largely explains the distribution of lower order settlements which essentially serve as market centres for agricultural inputs as well as for produce. Since agricultural activities are sparsely distributed we would expect such centres to be small as well as well distributed.

The existence of bigger centres is explained by the existence of large industries and services such as ports and transport nodes, as well as governmental centres. If these activities (exogenously determined) are regarded as "basic" or "export based", their distribution will determine the distribution of the urban population which must locate near these activities to service them. These are the second and the third layers. Thus each set of basic activities - primary, secondary and tertiary, have multipliers which determine the resulting urban population. According to this formulation, one has to isolate which of the secondary and tertiary activities are "basic". This is not easy but, consistent with the idea of economies of scale, large industry can be regarded as basic in the secondary sector. The location of much of large industry is also determined by proximity to raw materials-particularly iron and steel. This is determined by the principle of comparative advantage and may clearly be regarded as basic or exogenous. Similarly, the location of government activity can be regarded as exogenous. The latter is more troublesome for presumably, the distribution of government activities is itself determined by the location of other activities. To the extent, however, that it is discretionary, it may be regarded as basic or exogenous.

The task then in this paper is to investigate how the regional pattern of urbanisation and economic development in India conforms to this conception of an economy. Specifically,

it is sought to relate the variation in urbanisation between states to the variation of income and subsequently to explain the variations in urban population to different measures of the employment in basic activities. This is done at this time in particular to understand the pattern of urbanisation that has become apparent from the 1981 Census. It is important to make such an investigation since there is a widespread school of thought which believes that the pattern of urbanisation that exists in the country is highly concentrated and "dysfunctional".¹ Others allege that the urbanisation that has taken place in the country is in some sense artificial and not warranted by the existing structure of the economy. While this paper does not offer normative views on the desirable pattern of urbanisation in India its aim is to document the existing pattern disaggregated by states, how it has evolved over the past 30 years, and to provide some pointers to the determinants of urbanisation. If the pattern is found to be consistent with what might be expected and with what is generally found in other countries today and historically, it can at least be stated that the pattern observed is not surprising, is quite understandable and is at least warranted. It can still be regarded as undesirable from a normative viewpoint but it would then also be clear that a change in the pattern would require much greater and stronger policy measures.

¹This is well argued by Kundu and Raza (1982) for example.

The next section will document the record of urbanisation disaggregated by states in India since Independence. It will be the aim of the following section to explain the record documented in this manner, given the theoretical background outlined above.

II. The Regional Pattern of Urban Growth and Economic Development in India : The Record since Independence

The release of the provisional population totals of the 1981 census reveals a significant acceleration in the speed of urbanisation in the country. This is true whether comparison is made with the historical record since the beginning of the century or with what was expected as recently as in 1979.¹ The Sixth Five Year Plan projected the level of urban population to be about 148 million in 1981 and the level of urbanisation to be 22.04 per cent. In fact, the 1981 census shows that the level is about 156 million (but this number excludes Jammu and Kashmir and Assam not enumerated at the time of publication of census results). In another recent paper (Mohan and Pant, 1982) I have documented the fact that India has had a relatively slow but stable rate of growth in its urban population since about 1921 during which the level of urbanisation has inched up slowly from about 11.3 per cent of total population to about 23.7 per cent now. Despite the recent acceleration it must also be recognised that the rate of growth of urbanisation in India

¹Census of India. 1971. India. Series.1.
Report of the Expert Committee on Population Projections Paper 1 of 1979.

is still one of the slower in the world. A key feature of the Indian settlement pattern which emerged from the analysis was the very stable structure of settlements. While total urban population increased six fold between 1901 and 1981 the number of settlements increased by only 80 per cent. Thus most of the growth was because of the enlargement of existing towns at every level and not mainly because of the addition of new towns. This implies that the majority of settlements now classified as towns have exhibited urban characteristics for a very long time. The lack of addition of towns at the bottom end has remained something of a puzzle which has been remarked on by analysts often. Indeed, one result of this growth pattern is that the Indian settlement structure has become increasingly top heavy. The proportion of urban population residing in towns above any cut off point has risen continuously since the turn of the century. This phenomenon has led many observers to note that larger towns have grown faster than smaller ones. This is simply not true as has been documented in detail in the aforementioned paper. In reality the increasing proportion of urban population in larger cities has merely been the result of progressive accretion to existing settlements of all sizes which are relatively well spread out spatially. The lack of emergence of new towns or that of existing villages acquiring urban characteristics is indeed a matter for concern. To the extent that urbanisation is related to economic development and the distribution of lower order settlements is well explained by central place theory, the lack of such emergence of new urban settlements must be related to the relatively slow

growth of agriculture in many regions of the country coupled with the fact of settled cultivation having existing in India for a very long time. The latter would suggest a well distributed pattern of settlements which would get densified only if there were a relatively fast rate of growth in agriculture and consequently in agricultural demand for urban goods and services. This is an eminently researchable issue but is not addressed directly here.

Having stated that the Indian settlement structure has been quite a stable one it is necessary to disaggregate the trends in urbanisation, upto at least the state level. The variation in experience between states is surprisingly large and one that seems to be not readily explicable at first sight. Table 1 gives the level of urbanisation in the major states of India(i.e., those with population greater than 10 million in 1971 except Assam which is yet to be enumerated for the 1981 Census and Kerala). Kerala has not been included here because it poses particular problems in the definition of urban areas. Its overall population density was about 550 people per sq.km. in 1971, the rural density itself being about 480. Apart from those settlements which have an organised local body such as a municipality, corporation, cantonment board or notified town area committee which are classified as urban, the Indian census classifies settlements as urban if they have :

- I) a minimum population of 5000 and
- II) a density of at least 400 people per sq.km., and
- III) at least 75 per cent of the male labour force is in non-agriculture.

It turns out that in Kerala, in 1971, about 80 per cent of the rural population lived in villages of over 10,000 population and another 15 per cent in villages in the range of 5000 to 10,000 population. Hence almost all the settlements would qualify for classification as urban settlements were it not for the additional requirement of 75 per cent of the male labour force being in non-agriculture. With such high overall densities it is also not easy to decide on the boundaries of settlements Kerala has therefore been omitted in this descriptive part of the paper : it is included, however, in the more systematic analysis offered in the next Section.

Table-1
LEVEL¹ OF URBANISATION IN
STATES²
1951-1981

| State | Population of All Towns as % of Total | | | | Population of towns above 20000 only as % of total | | | |
|--------------------|--|------|------|------|---|------|------|------|
| | 1951 | 1961 | 1971 | 1981 | 1951 | 1961 | 1971 | 1981 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Andhra Pradesh | 17.4 | 17.4 | 19.3 | 23.3 | 10.8 | 13.2 | 16.0 | 21.1 |
| Bihar | 6.8 | 8.4 | 10.0 | 12.5 | 4.9 | 6.5 | 8.0 | 10.9 |
| Gujarat | 27.2 | 25.8 | 28.1 | 31.1 | 18.3 | 20.4 | 22.5 | 26.7 |
| Haryana | 17.0 | 17.2 | 17.7 | 22.0 | 10.9 | 12.5 | 13.9 | 18.1 |
| Karnataka | 22.9 | 22.3 | 24.3 | 28.9 | 13.4 | 15.6 | 18.2 | 23.9 |
| Madhya Pradesh | 12.0 | 14.3 | 16.3 | 20.3 | 7.7 | 9.7 | 12.2 | 15.7 |
| Maharashtra | 28.8 | 28.2 | 31.2 | 35.0 | 20.7 | 23.8 | 27.7 | 32.2 |
| Orissa | 4.1 | 6.3 | 8.4 | 11.3 | 2.1 | 3.5 | 6.0 | 9.0 |
| Punjab | 21.7 | 23.1 | 23.7 | 27.7 | 14.5 | 17.4 | 18.5 | 22.4 |
| Rajasthan | 18.5 | 16.3 | 17.6 | 20.9 | 10.3 | 10.8 | 12.9 | 16.5 |
| Tamil Nadu | 24.4 | 26.7 | 30.3 | 33.0 | 13.0 | 21.0 | 26.3 | 29.9 |
| Uttar Pradesh | 13.6 | 12.9 | 14.0 | 18.0 | 9.4 | 10.6 | 11.9 | 13.8 |
| West Bengal | 23.8 | 24.5 | 24.7 | 26.5 | 21.4 | 22.3 | 22.9 | 25.3 |
| India ³ | 17.6 | 18.3 | 20.2 | 23.7 | 12.3 | 14.5 | 16.9 | 20.5 |

- Notes : 1. Urban population as proportion of total population.
 2. Including all states with total population greater than 10 million in 1971 but excluding Kerala and Assam.
 3. Including all states except Assam and Jammu & Kashmir.

Source: Tables A.1 and A.2.

Table 1 gives the level of urbanisation in States according to two definitions. First is the population of all towns as per cent of the total population and second is the same but including the population in towns over 20,000 only. The definitional problems referred to above are essentially at the lowest levels. All settlements of 20,000 and over are easily classified as urban. Thus this avoids kinks in trends due to definitional problems. The most industrialised states of Maharashtra, Gujarat and Tamil Nadu are now all over 30 per cent urbanised (according to the census definition). The industrial stagnation of Calcutta is reflected in the level of urbanisation in that state since 1951. These states conform more to middle income countries with about \$ 400 per capita income in terms of the level of urbanisation. At the other end of the scale are Orissa (11.8%), Madhya Pradesh (20.3%) and Rajasthan (20.9%). There are only about 10 countries¹ in the world at the lowest per capita levels which have levels of urbanisation lower than 12 per cent. Thus, in terms of urbanisation levels, India's regions exhibit patterns spanning the whole range of about 50 countries with annual per capita incomes from about \$ 100 to \$ 400. The variation in levels of urbanisation² has, however, declined as measured by the coefficient of variation, from about 0.45 in 1951, to 0.42 in 1961,

¹Including Bhutan, Nepal and Bangladesh.

²The coefficient of variation in the levels of urbanisation is taken for levels according to urban population in towns above 20,000.

0.50 in 1971 to 0.34 in 1981. The acceleration in the least urbanised states along with the deceleration of the most urbanised ones has caused this major change in the last decade.

Table 2 gives the growth rates of urban population in States from 1951 to 1981. As is evident from column 3, all the relatively poorer states (Andhra Pradesh, Bihar, Madhya Pradesh, Orissa and Uttar Pradesh)¹ have experienced rapid urban growth during 1971 to 1981 while only Haryana among the richer states has experienced comparable growth. In fact, the old industrially developed states of West Bengal, Tamil Nadu and Maharashtra have the lowest growth rates. Naturally, absolute increases in urban population in these states continue to be large due to the higher initial levels. As in Table 1, columns 5-7 of Table 2 give comparable growth rates for urban population in towns above 20,000 only. While most of the observations made above are still valid, there are some changes that appear significant. The changes between decades are much less with this definition presumably because the definition is more consistent between the States. The acceleration between decades is also less pronounced - although the rate of growth for each State is much higher. This result extends the idea that the Indian settlement structure is of long standing and is also stable at the state level. Thus, the fact that the urbanisation

¹This is documented below.

rate for class III towns and above is higher than for all towns taken together again points to the fact that most urbanisation is by accretion to existing towns of all sizes and there are only small additions of new towns at the low end of the range. This now appears to be true at the state level as well. It may, however, be expected that in States such as Orissa, U.P. (particularly Eastern U.P.) and Madhya Pradesh (particularly Eastern Madhya Pradesh) where initial urbanisation levels are low and towns located sparsely, there would be a greater potential for the emergence of new towns. Indeed, one

Table -2
STATEWISE¹ GROWTH OF URBAN POPULATION
1951-1981

| State | All towns | | | Towns above 20000 only | | |
|--------------------|-----------|---------|---------|------------------------|---------|---------|
| | 1951-61 | 1961-71 | 1971-81 | 1951-61 | 1961-71 | 1971-81 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Andhra Pradesh | 1.5 | 2.9 | 4.0 | 3.5 | 3.9 | 5.0 |
| Bihar | 4.1 | 3.7 | 4.4 | 4.8 | 4.1 | 5.4 |
| Gujarat | 1.8 | 3.5 | 3.5 | 3.5 | 3.6 | 4.2 |
| Haryana | 3.1 | 3.1 | 4.8 | 4.4 | 3.9 | 5.2 |
| Karnataka | 1.7 | 3.1 | 4.2 | 3.5 | 3.8 | 5.3 |
| Madhya Pradesh | 4.0 | 3.9 | 4.6 | 4.6 | 5.0 | 4.8 |
| Maharashtra | 2.0 | 3.5 | 3.4 | 3.6 | 4.0 | 3.8 |
| Orissa | 6.5 | 5.2 | 5.3 | 7.4 | 7.9 | 6.0 |
| Punjab | 2.6 | 2.3 | 3.7 | 3.9 | 2.6 | 4.1 |
| Rajasthan | 1.1 | 3.3 | 4.6 | 2.8 | 4.3 | 5.4 |
| Tamil Nadu | 2.1 | 3.3 | 2.5 | 6.1 | 4.3 | 2.9 |
| Uttar Pradesh | 0.9 | 2.7 | 4.9 | 2.9 | 2.9 | 3.9 |
| West Bengal | 3.1 | 2.5 | 2.8 | 3.3 | 2.7 | 3.1 |
| India ² | 2.33 | 3.26 | 3.85 | 3.59 | 3.85 | 4.18 |

- Notes : 1. Including all States with total population greater than 10 million in 1971 but excluding Kerala and Assam.
2. Including all States except Assam & Jammu & Kashmir.

finds that with the second definition an acceleration in urbanisation is not apparent in these states indicating that much of the observed acceleration is because of the emergence of new towns.

The problems caused by variation across states in the classification of towns at the low end has already been alluded to. Table 3 indicates the differences caused by the addition of new towns in the 1981 census. The states which have added a significant number of new towns are essentially Haryana, Madhya Pradesh, Rajasthan, Orissa and Uttar Pradesh. Many of these towns in U.P. should have been classified as such in 1971 (Premi and others, 1977). Thus the apparent large acceleration of urbanisation in U.P. is at least partly illusory, though not entirely so. Taking the same towns as in 1971 (column 6, Table 3), the growth rate did increase from 2.7 per cent per year in 1961-71 to 3.1 per cent in 1971-81. Similarly, if only towns over 20,000 are considered (columns 6,7,Table 2), the rate increased from 2.9 to 3.9 per cent a year. Similarly, for Haryana, the corrected growth rate of 4.1 per cent is still significantly higher than the 3.1 per cent for 1961-71. The conclusion on the basis of Table 3 then is that the definitional problems of towns in the 1981 census do make a difference to the recorded growth rates of 4 or 5 particular states - showing a much larger increase - but do not alter the overall pattern described from the growth rate of urban population, whether it is according to the usual definition or that for towns above 20,000 population. The population of the added towns, as a proportion of state urban population, was 6 per cent for Haryana, 16 per cent for U.P. and 9 per cent for Orissa.

Table - 3

STATEWISE¹ GROWTH OF URBAN POPULATION
EXCLUDING NEW TOWNS ADDED IN 1981.

1971 - 1981

| State | No.of towns 1981 | No.of new towns ³ 1981 | Total Urban population excluding new towns 1981 ('000) | Annual Growth rate & Uncorrected ⁵ Corrected ⁶ | |
|--------------------|------------------------|--|---|---|------|
| | 1 | 2 | 3 | 4 | 5 |
| Andhra Pradesh | 234 | 29(2) | 12,160 | 4.0 | 3.8 |
| Bihar | 179 | 30(4) | 8,374 | 4.4 | 4.1 |
| Gujarat | 220 | 29(2) | 10,389 | 3.5 | 3.4 |
| Haryana | 79 | 17(6) | 2,641 | 4.8 | 4.1 |
| Karnataka | 250 | 34(4) | 10,327 | 4.2 | 3.9 |
| Madhya Pradesh | 303 | 72(6) | 9,956 | 4.6 | 3.9 |
| Maharashtra | 276 | 31(2) | 21,616 | 3.4 | 3.2 |
| Orissa | 103 | 27(9) | 2,836 | 5.3 | 4.4 |
| Punjab | 134 | 28(4) | 4,419 | 3.7 | 3.2 |
| Rajasthan | 195 | 43(7) | 6,612 | 4.6 | 3.8 |
| Tamil Nadu | 245 | 18(1) | 15,774 | 2.5 | 2.5 |
| Uttar Pradesh | 659 | 368(16) | 16,829 | 4.9 | 3.1 |
| West Bengal | 130 | 19(1) | 14,236 | 2.8 | 2.7 |
| India ⁴ | 3007 | 770(5) | 136,169 | 3.81 | 3.35 |

1. All states with 1971 population of 10 million and above.
2. No. of towns added in 1981 i.e., towns not classified as such in 1971 (including those classified as towns in an earlier census but not in 1971).
3. Figures in brackets give the population of new towns as a percentage of total urban population.
4. Including only the 13 states above.
5. Rate of growth of total urban population in States.
6. Rate of growth of urban population in state but excluding new towns in 1981 and excluding 1971 towns not found in 1981 census as detailed in Appendix 2.1.

Source: 1. Census of India 1981 Series I, India Paper 2 of 1981.

2. Census of India 1971 Series I, India Part II-A(i)
General Population Tables Statement 5, page 185.

At the all India levels then, the difference made by these definitional issues is small. The total population of the towns newly classified as such is only about 5 per cent of the total. For some of these which should have been classified as towns for the first time in this census this should not be regarded as an error. The "error" is caused by those towns, mostly in U.P., which should have been classified as towns in the 1971 census itself.

Table 4 which gives the rates of growth of rural population is of further interest. There have been significant declines in the rate of growth of rural population in the high agricultural productivity states of Haryana and Punjab but small increases have taken place in the low productivity states of Bihar, Rajasthan and U.P. There have, however, been declines in other poor states such as Orissa and Madhya Pradesh. Preliminary census results indicate that for the first time since the turn of the century, there may have been a perceptible decline in the proportion of labour force engaged in agriculture - from 69.8 per cent in 1971 to 66.7 per cent in 1981 (J.N. Sinha, 1982). This is at least consistent with the decline in the overall rate of rural population growth. Increases in agricultural production are now coming mainly from productivity changes - only small increases in cropped area can now be recorded. There are therefore indications that the absorptive capacity of agriculture for continued increases in population and labour force is now declining.

Table 5 tabulates the urban-rural growth differential (U.R.G.D) - yet another index of urbanisation. This is merely the difference between the urban and rural population growth rates. The acceleration in the urbanisation experience is even more evident from this table - since urban population growth rates have increased in general while rural growth rates have declined. Again, it is only Tamil Nadu which shows a decline: there have been significant increases in all other states. The progress over the three decades is quite remarkable. There were as many as 5 States with negative URGD, only one with less than 1.0 and as many as 9 with over 2.0. The rural urban transformation and its acceleration in all the States therefore stands out with much greater clarity by considering URGD.

It is interesting to find that the distribution of population growth rates for rural as well as urban areas has tended to become more uniform between states over the same period. The coefficient of variation between states of rural population growth rates has declined from 0.36 for 1951-61 period to 0.17 for 1961-71 and 0.16 for 1971-81. The corresponding coefficients for urban population growth are 0.31, 0.31 and 0.20 respectively.¹ Furthermore, the pattern is confirmed

¹These coefficients of variation for urban population growth are calculated for the growth of towns above 20,000 only (Columns 5,6,7 in Table 2) to avoid the variations due to low end definitional problems.

if taken back to the 1941-51 decade as well. The coefficient of variation for rural population growth rates for that decade was about 0.49 and for urban population growth rates about 0.31 again. What is of great interest is that the variation in urban population growth rates has declined as well in the past decade.

Table - 4

STATE-WISE¹ GROWTH OF RURAL POPULATION IN
1951-1981

| State | Annual Rate of Growth of Rural Population (Per cent per year) | | |
|--------------------|---|---------|---------|
| | 1951-61 | 1961-71 | 1971-81 |
| 1 | 2 | 3 | 4 |
| Andhra Pradesh | 1.46 | 1.68 | 1.60 |
| Bihar | 1.64 | 1.78 | 1.89 |
| Gujarat | 2.61 | 2.29 | 2.00 |
| Haryana | 2.93 | 2.78 | 1.96 |
| Karnataka | 2.06 | 1.93 | 1.73 |
| Madhya Pradesh | 1.92 | 2.31 | 1.77 |
| Maharashtra | 2.22 | 2.03 | 1.62 |
| Orissa | 1.58 | 2.03 | 1.43 |
| Punjab | 1.79 | 1.89 | 1.55 |
| Rajasthan | 2.63 | 2.32 | 2.42 |
| Tamil Nadu | 0.81 | 1.53 | 1.20 |
| Uttar Pradesh | 1.65 | 1.68 | 1.81 |
| West Bengal | 2.80 | 2.37 | 1.85 |
| India ² | 1.89 | 2.00 | 1.75 |

- Notes : 1. Including all states with a population of 10 million or more in 1971 excluding Kerala and Assam.
2. Including all states except Assam and Jammu and Kashmir.

Table - 5

URBAN RURAL GROWTH DIFFERENTIAL (URGD)
BY STATES¹

1951-1981

| State 1 | URGD ³ | | |
|--------------------|-------------------|--------------|--------------|
| | 1951-61 2 | 1961-71 3 | 1971-81 4 |
| Andhra Pradesh | 0.01 | 1.28 | 2.42 |
| Bihar | 2.43 | 1.93 | 2.55 |
| Gujarat | -0.76 | 1.21 | 1.48 |
| Haryana | 0.12 | 0.31 | 2.80 |
| Karnataka | -0.37 | 1.13 | 2.44 |
| Madhya Pradesh | 2.06 | 1.59 | 2.78 |
| Maharashtra | -0.27 | 1.45 | 1.79 |
| Orissa | 4.87 | 3.19 | 3.91 |
| Punjab | 0.79 | 0.39 | 2.14 |
| Rajasthan | -1.58 | 0.99 | 2.20 |
| Tamil Nadu | 1.25 | 1.79 | 1.28 |
| Uttar Pradesh | -0.70 | 1.03 | 3.08 |
| West Bengal | 0.32 | 0.16 | 0.93 |
| India ² | 0.48 | 1.29 | 2.11 |

- Notes : 1. Including all states with a population of 10 million or more in 1971. but excluding Kerala and Assam.
2. Including all states except Assam and Jammu & Kashmir.
3. Taken as the difference between the growth rate of total urban population (census definition) and rural population growth rates.

It may be somewhat premature to draw strong conclusions from the decline of this one inequality measure - the coefficient of variation - in one decade after it had been stable for 3 decades. Firstly, this decline is presumably a result of the lower variation across states in total population growth rates. But it may also be a result of the dispersal of industrialisation that has taken place between states - although this is still of small magnitude. Sekhar (1983) has documented the decline in the index (the Theil Index) of inequality between states in organised industry over the last 2 decades - whether measured by value added or employment. It must be emphasised that the changes have been small: as late as 1976 Maharashtra, West Bengal, Gujarat and Tamil Nadu together accounted for about 55 per cent of all value added and 52 per cent of all employment in the manufacturing (factory) sector. In 1961, in comparison, these four states accounted for as much as 66 per cent of valued added and 58 per cent of employment. Given this small change, not much can be made of the decline in variation in rate of urbanisation - only that the two results are at least consistent with each other.

How can all these data be summarised? Table 6 groups all the states into four categories. The variation in the experience of the different groups of states is immediately apparent. Thus, even in the case of richer states, two patterns that are diametrically opposite are revealed. Thus in the old industrially and commercially developed states of Maharashtra and Gujarat,

the urban growth rate increased initially but tapered off thereafter while in the agriculturally progressive developed states of Punjab and Haryana the opposite was experienced. Clearly different forces are at work in these States and more detailed analysis is required before further generalisation.

Having examined the record of urbanisation it is now necessary to look at different indices of economic development over the same period. Consistent data are, however, difficult to obtain for 1951 because of the reorganisation of States in 1956. Hence only the record since 1961 is presented. Considerable controversy surrounds the magnitudes of per capita state product. Given a countrywide common market it is difficult to compute State domestic product. However, State Statistical bureaus as well as the Central Statistical office (C.S.O.) make annual estimates of the state domestic product (SDP). There are usually discrepancies between the two sets of estimates and the C.S.O. issues a set of consistent estimates with some lag. These are currently available for 1970-71 to 1975-76. More difficult still is a constant price series of SDP and no official series has been issued. The data used here are from a compilation of data by the Centre for Monitoring the Indian Economy, an independent organisation. While recognising that individual errors might exist in these data they are considered adequate for the purpose at hand: they do give a good picture of the magnitude and pattern of disparity in incomes between states and how this pattern has evolved over the past 20 years.

Table 7(1) gives estimates of per capita SDP at constant 1970-71 prices for 1961, 1971 and 1978-79 the latest data available for a "normal" year. The coefficient of variation (C.V.) for per capita income has moved from 0.23 in 1961 to 0.26 in 1971 to 0.33 in 1979. This is in the opposite direction from the C.V. for level of urbanisation which are 0.37, 0.34 and 0.29 for the same years respectively. The ratio of the per capita s.d.p. of the richest to the poorest state was about 2 in 1961, 2.5 in 1971 and 3 in 1981.

Table - 6
URBAN GROWTH IN STATES DURING 1951-81

| Category of states 1 | All towns 2 | Towns of population above 20,000 only 3 |
|--|--|--|
| | | |
| I. States where the rate of growth of urban population has increased continuously since 1951-61 | Andhra, Karnataka, Rajasthan and Uttar Pradesh | Andhra, Gujarat, Karnataka and Rajasthan |
| II. States where the rate increased between 1951-61 and 1961-71 but declined or remained constant thereafter. | Gujarat, Maharashtra and Tamil Nadu | Madhya Pradesh, Maharashtra and Orissa. |
| III. States where the rate declined or remained constant between 1951-61 and 1961-71 but increased thereafter. | Punjab, Orissa, Bihar, Haryana, Madhya Pradesh, Punjab, Uttar Pradesh and West Bengal. | Bihar, Haryana, Punjab, Uttar Pradesh and West Bengal. |
| IV. States where the rate of growth of urban population has increased continuously since 1951. | None | Tamil Nadu |

Source : Table 2

Table - 7(1)

SOME SELECTED INDICATORS OF ECONOMIC
DEVELOPMENT

| States | Per Capita State NDP (constant 1970-71 prices) | | | Value added in Factory Sector (Current Rs.per Capita) | | |
|-----------------------------|--|------|-------------------|---|------|-------------------|
| | 1961 | 1971 | 1981 ¹ | 1961 | 1971 | 1981 ² |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Andhra Pradesh | 518 | 586 | 678 | 9 | 29 | 74 |
| 2. Bihar | 390 | 418 | 438 | 14 | 31 | 57 |
| 3. Gujarat | 697 | 845 | 884 | 52 | 108 | 245 |
| 4. Haryana | 627 | 932 | 1029 | | 70 | 169 |
| 5. Karnataka | 559 | 675 | 723 | 14 | 62 | 107 |
| 6. Kerala | 471 | 636 | 569 | 17 | 42 | 93 |
| 7. Madhya Pradesh | 472 | 489 | 463 | 8 | 27 | 68 |
| 8. Maharashtra | 769 | 811 | 1008 | 69 | 167 | 324 |
| 9. Orissa | 392 | 541 | 514 | 6 | 27 | 62 |
| 10. Punjab | 760 | 1067 | 1308 | 4 | 52 | 136 |
| 11. Rajasthan | 500 | 629 | 591 | 5 | 26 | 56 |
| 12. Tamil Nadu | 571 | 616 | 682 | 24 | 75 | 166 |
| 13. Uttar Pradesh | 457 | 493 | 524 | 9 | 24 | 47 |
| 14. West Bengal | 758 | 729 | 765 | 60 | 97 | 173 |
| Mean | 558 | 676 | 727 | 23 | 60 | 127 |
| Coefficient of variation | 0.23 | 0.26 | 0.33 | 0.92 | 0.67 | 0.62 |

Notes: 1. 1978-79 data

2. 1977-78 data

By international standards these are not high numbers but obviously a matter of some concern that spatial disparities are getting worse in the country.

It is useful to get an idea of regional disparities in other countries to get a better perspective on our own. For example, the c.v. for Argentina was 0.59, Brazil 0.58, Philippines 0.75 and Thailand 0.50, in the early to late sixties¹.

¹From Gugler and Gilbert.(1982)

The average (unweighted) for 15 less developed countries tabulated was 0.48. The ratio of the poorest to richest regions was about 12 in Indonesia, 9 in Brazil and 5 in Colombia. By these standards, the income disparity between states is very low in India but what may be a matter of deep concern is the worsening of the disparity over time. This has been well appreciated in Indian planning and preferential allocation of funds to the poorer states has been incorporated for some time. Furthermore, there is an elaborate system of incentives for industries to locate in the poorer regions of the country.

The average (unweighted) for 15 less developed countries tabulated was 0.48. The ratio of the poorest to riches regions was about 12 in Indonesia, 9 in Brazil and 5 in Colombia. By these standards, the income disparity between states is very low in India but what may be a matter of deep concern is the worsening of the disparity over time. This has been well appreciated in Indian planning and preferential allocation of funds to the poorer states has been incorporated for some time. Furthermore, there is an elaborate system of incentives for industries to locate in the poorer regions of the country.

Table 7(1) also presents data on the per capita value added in the factory sector. Note that these data are in current prices. The c.v. has declined from 0.92 in 1961 to 0.67 in 1971 and 0.62 in 1978. The ratio of the highest to the lowest was about 14 in 1961, and 7 in 1971 and 1978 (there being a small decline between the latter two years). It is

clear then that the worsening disparity in state incomes has not been caused by the manufacturing factory sector - indeed there has been a strong opposite trend toward equalisation in this sector. The poorest 3 States in 1961 were Bihar, Orissa and Uttar Pradesh in terms of income. They also had along with Andhra Pradesh, Madhya Pradesh and Rajasthan, the lowest value added per capita in the factory sector. The position has not changed much in 1981 and these three states remain among the bottom five or six according to both the indicators. The rates of increase in the factory sector value added have, however, been higher in the poorer states. It is quite noticeable from the factory sector valued added table that from a situation when the only substantial manufacturing was in Gujarat, Maharashtra, West Bengal and Tamil Nadu, and located around their capital cities, there has been a considerable dispersal of industry by now.

The first panel in Table 7(2) gives the data on agricultural productivity. This has been defined as the total production of foodgrains per male agricultural labour. Only male labour has been used because of the well known definitional changes in the 1971 census which has made the female agricultural labour data non-comparable with other years. The data for males is believed to cause fewer problems. The increase in disparity - c.v. increasing from 0.30 in 1961, to 0.59 in 1971 and 0.73 in 1981 - is quite striking and consistent with the increasing income disparity. The stagnation in agricultural productivity

in the whole Eastern region is the main cause of the increasing inequality. Productivity has actually decreased or remained almost constant in Bihar, Orissa, West Bengal, Madhya Pradesh and Uttar Pradesh. The data for '1981' are somewhat on the low side because the extremely bad year of 1979-80 has been included in the average computed. The comparative picture would, however, not change much.

The next panel gives another useful indicator, the power consumption per capita. It is clear that there have been large overall increases in power consumption in all states. The 'c.v.' declined from 0.61 in 1961 to 0.38 in 1971 but then increased again in 1981. Note the very high increases in Punjab and Haryana. Consistent with industrial as well as agricultural stagnation of West Bengal, it is the only state which does not record an increase in per capita consumption of power.

Table 7(3) gives two more indicators - the male agricultural employment and total factory employment as percentages of their respective totals. There has been a clear decline in percentage male agricultural employment in all states except Tamil Nadu and U.P. between 1961 and 1981. There was a general increase between 1961 and 1971, possibly because of definitional problems. On the other hand, except for West Bengal, and, as might be expected, the proportion of people employed in the factory sector has increased between 1961 and 1981 in all the states.

All these results are quite consistent with some of the conjectures offered on the pattern of urbanisation observed. The decrease in disparity in the manufacturing factory sector - both in terms of value added as well as in employment - would lead to more uniform urbanisation since almost all factories would be found in urban areas. To the extent that factory employment has large multipliers for service, small manufacturing and government its effect on urbanization would be reinforced. The decrease in the proportion employed in agriculture (a very significant decrease by Indian historical standards) accompanied by stagnation in agricultural productivity suggests the "push" factor operating in the poorer states. This is particularly so since, despite the decrease in agricultural employment (proportionally) it has been pointed out that foodgrains output per male agricultural labour has declined or remained constant in the poorer states. Although there is a significant increase in the labour employed in factories in these states, they do not appear large enough to cause the decrease in agricultural employment.

The composite picture that emerges then is as follows. There has been a perceptible increase in interstate inequality as measured by per capita state domestic product. This has been caused largely by the stagnation in agricultural productivity in the whole Eastern, Central-Eastern and South Eastern regions. There have been notable increases in factory production in all states and particularly so, in relative terms, in the hitherto backward states. This movement has mitigated somewhat the

increasing interstate inequality but the favourable changes have not been large enough to counteract the adverse changes in agriculture. The combination of increased manufacturing production and agricultural stagnation in the poorer states is likely to have caused the significant acceleration in urbanisation in the last decade. The data suggest that the absorptive power of agriculture has probably been stretched to its limit in the sense that minimum per capita subsistence limits may have been reached. In the earlier periods, there was considerable scope for extensive increase in the area under cultivation. It was therefore, possible to accommodate the increase in population and consequently, agricultural labour by extension of cultivation to hitherto uncultivated lands. These possibilities have now been exhausted. Increases in agricultural productions now can only take place by productivity changes, i.e., technological change. This seems very clear for the whole rice region: if there is labour using productivity change there will be an initial increase in labour absorption. The indications from Punjab and Haryana are that after the initial labour absorption, after income increases have taken place, and the agriculture becomes more technologically intensive, it is likely that urbanisation would again accelerate. The indications therefore are that both agricultural stagnation as well as growth is likely to contribute towards further urbanisation in the country in the foreseeable future.

Table - 7(2)

SOME SELECTED INDICATORS OF ECONOMIC DEVELOPMENT

| State | Agricultural Productivity ⁵ (tons per person) | | | Power consumption per capita (KWH) | | |
|--------------------------|---|-------------------|-------------------|------------------------------------|------|-------------------|
| | 1961 ¹ | 1971 ² | 1981 ³ | 1961 | 1971 | 1981 ⁴ |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 1. Andhra Pradesh | 0.88 | 0.83 | 1.06 | 20 | 56 | 93 |
| 2. Bihar | 0.71 | 0.69 | 0.67 | 23 | 65 | 87 |
| 3. Gujarat | 0.59 | 0.94 | 0.85 | 55 | 138 | 231 |
| 4. Haryana | | 2.77 | 2.91 | | 98 | 211 |
| 5. Karnataka | 0.82 | 1.06 | 1.13 | 41 | 104 | 149 |
| 6. Kerala | 0.60 | 0.50 | 0.65 | 36 | 76 | 97 |
| 7. Madhya Pradesh | 1.24 | 1.26 | 0.98 | 16 | 54 | 96 |
| 8. Maharashtra | 0.92 | 0.65 | 1.17 | 78 | 158 | 230 |
| 9. Orissa | 0.98 ⁶ | 0.96 | 0.98 | 32 ₆ | 96 | 115 |
| 10. Punjab | 1.73 | 3.07 | 4.36 | 70 | 159 | 303 |
| 11. Rajasthan | 1.10 | 1.44 | 1.05 | 3 | 50 | 93 |
| 12. Tamil Nadu | 0.90 | 0.98 | 1.07 | 58 | 130 | 184 |
| 13. Uttar Pradesh | 0.85 | 0.99 | 0.99 | 14 | 60 | 88 |
| 14. West Bengal | 0.92 | 1.11 | 1.04 | 75 | 118 | 118 |
| Mean | 0.94 | 1.23 | 1.35 | 40 | 97 | 150 |
| Coefficient of Variation | 0.30 | 0.59 | 0.73 | 0.61 | 0.38 | 0.45 |

- Notes :
1. Average of 1959-60 to 1961-62
 2. Average of 1970-71 and 1971-72
 3. Average of 1978-79 to 1980-81
 4. 1978-79 data.
 5. Defined as Total Foodgrains output in the State divided by total Male agricultural labour.
 6. Undivided Punjab.

Table - 7(3)

SOME SELECTED INDICATORS OF ECONOMIC DEVELOPMENT³

| State 1. | % Male Agricultural Employment | | | % Total Factory Employment | | |
|--------------------------|--------------------------------|-----------|-----------|----------------------------|-----------|-----------|
| | 1961 2 | 1971 3 | 1981 4 | 1961 5 | 1971 6 | 1981 7 |
| 1. Andhra Pradesh | 67 | 69 | 63 | 1.2 | 1.5 | 2.3 |
| 2. Bihar | 78 | 82 | 78 | 1.0 | 1.6 | 1.8 |
| 3. Gujarat | 63 | 65 | 57 | 4.3 | 5.3 | 5.8 |
| 4. Haryana | | 67 | 50 | | 3.5 | 4.5 |
| 5. Karnataka | 69 | 69 | 62 | 1.6 | 2.8 | 3.6 |
| 6. Kerala | 46 | 54 | 39 | 3.1 | 3.4 | 4.4 |
| 7. Madhya Pradesh | 77 | 78 | 72 | 1.0 | 1.5 | 1.7 |
| 8. Maharashtra | 62 | 60 | 52 | 4.4 | 5.7 | 4.9 |
| 9. Orissa | 77 ³ | 80 | 74 | 0.5 ³ | 1.0 | 1.0 |
| 10. Punjab | 61 | 65 | 60 | 1.9 | 3.0 | 3.9 |
| 11. Rajasthan | 74 | 75 | 67 | 0.6 | 1.1 | 1.8 |
| 12. Tamil Nadu | 59 | 61 | 64 | 2.3 | 3.1 | 3.3 |
| 13. Uttar Pradesh | 73 | 77 | 74 | 1.2 | 1.5 | 1.7 |
| 14. West Bengal | 58 | 61 | 56 | 6.4 | 6.8 | 5.7 |
| Mean | 66.5 | 68.8 | 62.7 | 2.25 | 2.99 | 3.31 |
| Coefficient of Variation | 0.14 | 0.12 | 0.16 | 0.76 | 0.59 | 0.47 |

Notes : 1. Total male agricultural employment as percentage of total male employment.

2. Total factory employment as percentage of total employment.

3. For undivided Punjab.

III. The Determinants of Urbanisation :
Some Explorations

3.1 The Level of Urbanisation

As mentioned in the introduction, the relationship between urbanisation and per capita income has been a long established one for international cross section as well as time series data. The hypothesis is that the shape of the relationship is logistic as expressed by an equation of the type

$$U = \frac{a}{1 + b \exp(-c \log Y)} \dots \dots \dots (1)$$

where U is per cent urban population and Y is per capita g.n.p. Good fits are generally found for such an equation.

The most recent estimation of this type has been by Mills and Becker (1982) who have estimated a variant of (1). They have added a variable measuring the level of agricultural activity - the share of the labour force in agriculture. An alternative was to include a measure of manufacturing activity but the former was found to be a better predictor of urbanisation in such a formulation. They estimated a logistic form of the equation as well as a quadratic one of the form:

$$U = a_0 + a_1 Y + a_2 Y^2 + a_3 A + a_4 t \dots \dots \dots (2)$$

A is share in agricultural employment and t is a time trend.

If $a_1 > 0$

and $a_2 < 0$

this equation predicts U to start declining after some maximum

for a constant A. They found both these formulations to perform quite well with a large set of international data spanning the 1960 to 1980 period. The level of explanation achieved (R^2) was about 0.77, i.e., as simple a formulation as this was found to account for 77% of the variance in urbanisation levels in the world.

I utilize a similar framework for attempting to explain the variance in urbanisation between states in India. Consistent data are now largely available as shown in the last section for 1961, 1971 and 1981. Except for population data, most of the other data are not available yet for 1981, e.g., for SDP, agricultural production, etc. In each case the nearest available year has been used. Equations such as (1) and (2) are justified on the kind of theoretical bases given in Section I. They are neither structural nor reduced form equations : per capita income urbanisation levels, share of agricultural employment, are all endogenous variables resulting from the kind of interactions sketched earlier. But the confirmation of the associations predicted do give some support to the theory.

I estimate essentially three types of equations :

$$U = a_0 + a_1 Y + a_2 Y^2 + a_3 A + a_4 t \quad \dots \dots (3)$$

$$\text{or } U = b_0 + b_1 Y + b_2 Y^2 + b_3 M + b_4 t \quad \dots \dots (4)$$

$$\text{or } U = c_0 + c_1 Y + c_2 Y^2 + c_3 A + c_4 M + c_5 t \quad \dots \dots (5)$$

where U = level of urbanisation in the State

Y = per capita state domestic product

A = an index of agricultural activity

M = an index of manufacturing activity

and t = time trend.

The exact definitions of the variables used are given in Table 8.

A measure of state domestic product per capita (SDP) at constant prices is used for Y; the share of male agricultural employment in total male employment (%LAGRM) and agricultural labour productivity (FGNS) expressed as total foodgrain production per agricultural labour are used as alternative measures for A; while the share of factory employment, value added per capita in the factory sector and per capita power consumption are the alternative measures for M.

Table 9(a) gives the regression results estimated by ordinary least squares. Variables are added in a step wise fashion to test for the stability of individual variables. The coefficients for SDP and $(SDP)^2$ are highly significant and have the predicted signs. The time trend does not add to the level of explanation. This suggests that there is no built in trend towards urbanisation over time. It argues against those who claim that much of the urbanisation taking place is merely because of population pressure and is unrelated to economic growth. The consistently insignificant coefficient of t suggests that with stagnating income one would not expect increasing urbanisation over time. Regressions (3) and (4) suffer somewhat from collinearity problems: %LFACT has a correlation coefficient of about 0.66 with SDP and about -0.7 with LAGRM. Nonetheless, the coefficient of %LFACT(1.06) in regression (3) is significant at the 5% level. Ceteris parilus, i.e., keeping income constant,

a one percentage point increase in the share of factory employment would lead to a one per cent increase in the level of urbanisation. The coefficient of LAGRM has the expected negative sign - an increase in the share of agricultural employment would lead to a small decrease in urbanisation.

Table - 8

Definition of Variables

Dependent Variables

- | | |
|---------------|---|
| 1. URB | Level of Urbanisation (Total Urban Population as a proportion of Total Population). |
| 2. URBPOP | Total Urban Population (in thousands of persons). |
| 3. CLASS I | Total Population of Class-I Cities (in thousands of persons) i.e., Cities over 100,000 population. |
| 4. NONCLASS I | Total Population of Non Class-I Cities (in thousands of persons) i.e., Cities under 100,000 population. |

Independent Variables

A. Income Variables

- | | |
|------------|---|
| 1. SDP | State Domestic Product per Capita (in 1970-71 constant prices). 1978-79 data used for 1981. |
| 2. SDP^2 | $(SDP)^2$ |

B. Employment Variables (all measured in thousands of persons).

- | | |
|----------|---|
| 3. LFACT | Total Employment in factories. (All factories using power and employing more than 10 people and others employing more than 20 people). 1979 data used for 1981. |
| 4. LAGRM | Total male employment in agriculture. |

¹This is defined as the excess employment in manufacturing over that required for domestic services. This minimum is approximated by the lowest proportion found among the sample of states.

| | |
|-------------|--|
| 5. LMNHM | Total male employment in non-household industries. (No 1981 data) |
| 6. LFACMX | Total employment in factories in "net export manufacturing activities". |
| | $\text{LFACT}_i = \min \left(\frac{\text{LFACT}_i}{\text{Total Employment}_i}, \frac{\text{Total Employment}_i}{\text{Employment}_i} \right)_i$ |
| 7. LGOCT | Total employment in Central Government. (This does not include "Productive" enterprises. i.e., public enterprises). 1980 data used for 1981. |
| 8. LGOST | Total employment in State government. 1980 data used for 1981. |
| 9. % LFACT | LFACT as percentage of total employment in the State. |
| 10. % LAGRM | LAGRM as percentage of total male employment in the State. |

C. Other Indicators of Economic Developments

| | |
|-----------|--|
| 11. VAFAC | Value added per capita in factory sector in the State (current Rs.per person). 1977-78 data used for 1981. |
| 12. KWH | Total Power consumed per capita in the State (KWH/person). 1978-79 used for 1981. |
| 13. FGNS | Total Foodgrains output per male agricultural labour in the State (tons per person). Average of 1978-79 to 1980-81 used for 1981. <u>(Total Food grains Output)</u> LAGRM |

D. Other

| | |
|-------|--|
| 14. t | Time variable. 1961=1, 1971=2, 1981=3. |
|-------|--|

Note

See Appendix for sources of data.

Table - 9(a)

URBANISATION AND ECONOMIC DEVELOPMENT IN
INDIAN STATES 1961-1981 (1)

Dependent Variable :URB
(Level of Urbanization)

| Independent Variables | 1 | 2 | 3 | 4 | 5 |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|
| Constant | -24.30 (1.69) | -25.11 (1.72) | -17.23 (0.97) | -7.80 (0.41) | -13.92 (0.98) |
| SDP | 0.108 (5.43) | 0.107 (5.34) | 0.081 (3.29) | 0.079 (3.20) | 0.083 (4.25) |
| SDP ² | -0.000055 (4.29) | -0.000055 (4.27) | -0.000043 (2.86) | -0.000040 (2.77) | -0.000044 (3.73) |
| % LFACT | | | 1.06 (1.71) | 0.672 (1.07) | |
| % LAGRM | | | | -0.112 (1.07) | |
| VAFAC | | | | | 0.049 (3.16) |
| KWH | | | | | |
| FGNS | | | | | |
| t | | 0.72 (0.77) | 0.65 (0.72) | 0.67 (0.74) | -1.14 (1.11) |
| R ² | 0.631 | 0.637 | 0.664 | 0.675 | 0.716 |
| \bar{R}^2 (Adjusted R ²) | 0.612 | 0.608 | 0.627 | 0.629 | 0.684 |

Notes

1. All regressions run with 41 observations.
13 states in 1961 and 14 each in 1971 and 1981.
(Punjab and Haryana combined in 1961)
2. t Statistics in parenthesis.

The output variable for M performs somewhat better. The coefficient of VAFAC (the value added per capita in the factory sector) is highly significant (regressions 5 and 7) and adds considerably to the magnitude of variance explained, despite correlation with S.D.P. (0.65). The other proxy for M that is used is power consumption per capita (KWH). The coefficients for this are also highly significant and stable (regressions 6,8,9). Finally, the last variable utilised is FGNS (agricultural labour productivity) - this has a negative sign but is not found to be statistically significant. It does indicate that, ceteris paribus, higher agricultural labour productivity would tend to decrease urbanisation.

It is of interest to analyse the implications of these regressions a bit further. The R^2 s obtained are gratifyingly high - in the range of 0.75. These equations succeed in explaining as much as 75% of the variance between states in urbanisation. Furthermore, if the definition of urban population is taken to include only towns above 20,000 population, and the dependent variable URB is changed accordingly, it is found that R^2 increases to about 0.82. This is presumably because, as was suggested in the last section, the definitional problems at the lower end of the settlement scale are eliminated. Consequently, the variation between states as well as over time that is due to inconsistent definition is eliminated. One interesting feature of these estimates is that the maximum positive effect of income on urbanisation is reached at relatively low income levels and

is in fact within the sample. In fact, the maximum effect is reached in the range of about Rs. 750 to 950 per capita income (1970-71 prices) in different regressions.

Table-9(b)

URBANIZATION AND ECONOMIC DEVELOPMENT IN
INDIAN STATES 1961 - 1981 (2)

Dependent Variable : URB (Level of Urbanisation)

| Independent Variables | | | | | |
|-----------------------|---------------------|---------------------|---------------------|---------------------|---------------------------------|
| Constant | -19.85 (1.49) | -4.28 (0.27) | -6.47 (0.42) | -5.06 | -3.70 (0.21) |
| SDP | 0.103 (5.80) | 0.075 (3.64) | 0.090 (4.73) | 0.079 (3.71) | 0.069 (3.16) |
| SDP ² | -0.000065 (5.61) | -0.000040 (3.24) | -0.000058 (4.68) | -0.000043 (2.50) | -0.000031 (1.85) |
| % LFACT | | | | | |
| % LAGRM | | -0.098 (1.14) | -0.125 (1.55) | 0.087 (1.01) | -0.075 (0.83) |
| VAFAC | | | 0.044 (2.74) | | 0.031 (1.45) |
| KWH | | 0.093 (3.47) | | 0.087 (3.28) | 0.071 (2.37) |
| FGNS | | | | | -2.34 (1.19) -2.17 (0.89) |
| t | | -2.72 (2.12) | -0.96 (0.93) | -2.52 (1.99) | -1.97 (1.47) -0.54 (0.48) |
| R ² | | 0.728 | 0.726 | 0.746 | 0.756 0.732 |
| R̄ ² | | 0.698 | 0.687 | 0.709 | 0.713 0.685 |

Notes : See Table 9(a).

In international data this turning point naturally comes at much higher incomes. The reason is essentially that this is a ceteris paribus result: If the share of agricultural employment or factory employment remains constant, this is in fact what would happen. This can be illustrated with reference to Punjab. Punjab now has the highest SDP but its urbanisation level of 27.7 per cent is only the fifth among States. Increases in income without accompanying declines in agricultural employment or increase in manufacturing tends to keep the level of urbanisation down. The interconnected simultaneous processes sketched in Section 1 are therefore being captured well in these equations. It is admitted that it is somewhat tautological to say that without a decline in agricultural employment urbanisation will not increase. But when does this happen? This occurs in two kinds of situation. First, when income increases only in the urban sector, that is in a highly dualistic economy, without matching changes in the subsistence agricultural sector. Second when income increases in the agricultural sector because of labour using technological changes - perhaps like in the Punjab. But both the situations have their limits. When urban/rural income disparities become too great; migration is induced: but the employment problem remains unless labour using urban technologies are found. Similarly, as may be happening in the Punjab, as agricultural incomes increase further and the demand for urban goods increases then increased demand for urban labour would tend to take labour from rural areas which would then also have the effect of quicker introduction of labour

saving technology in agriculture. The results from the equations estimated would be consistent with these kind of changes in the economy.

Further insight is gained by comparing the fitted values with the actual levels of urbanisation. To the extent that the estimations reflect some "norm" the errors in prediction reflect "under" or "over" urbanisation. Consider the case of the poorer states first which have been found to urbanise relatively rapidly in the past decade. Bihar and Orissa are found to be consistently "under" urbanised, i.e., they are expected to be more urbanised than they are. But this gap has been consistently reduced over the last 20 years, particularly in the last decade. This presumably reflects the highly capital intensive nature of the industries in those states - given their income levels, albeit low, higher levels of urbanisation would have been expected. To the extent that the nature of industry has not changed over this period, and that this has been accompanied by agricultural stagnation, it would be valid to infer that this catch up phenomenon has been of the push migration variety. It was documented in Mohan & Pant (1982) that this increased urbanisation in these states is largely accounted for by very high growth in urban population in the regions which have received the most industry. These, however, are still quite concentrated - in the Southern region of Bihar for example - so that the expected level of urbanisation is still higher than the actual even after rapid urbanisation in

in the past decade. Among the other poor states, U.P. is close to the predicted value in all years when small towns with less than 20,000 population are excluded. But if the total urban population is used the 1981 actual value is much higher than predicted implying over-urbanisation. This suggests that the acceleration in urbanisation in U.P. is essentially due to definitional changes as was found in the last section. Otherwise, U.P. gives no cause for surprise. Madhya Pradesh was close to the predicted value in 1961 but has "over" urbanised considerably over the past two decades. This is true even if small towns are excluded and is therefore not a definitional problem. Given that industrial investment there has been concentrated in the Eastern region of the State. This result again suggests "push" from rural areas in Madhya Pradesh also.

Among other states, Kerala is consistently under-urbanised this may be because of the definitional problems alluded to earlier. Haryana is also under-urbanised though less so in 1981 - this is consistent with the productivity gains made there in agriculture and which have been labour using. Urbanisation is, however, catching up because of continuing income increases. The rest of the states - Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan and West Bengal may be termed normal in that their predicted and actual values are quite close in all three years.

3.2 Urban Population : Employment Multipliers

Having established the pattern of inter-state variation in overall urbanisation found in India is quite consistent with a simple formulation of the relationship between urbanisation and economic development, it is now necessary to elaborate this further by attempting to find the determinants of the absolute levels of urban population found. The methodology adopted is essentially that of Mera (1975) who has suggested a "layer" theory of urbanisation as outlined in Section I. The idea is to relate the magnitude of urban population to categories of basic employment, i.e.,

$$U_1 = d_1^P + d_2 S + d_3 T \quad \dots \dots \quad (6)$$

where U_1 is urban population, P, S and T are the basic employment in the primary, secondary and tertiary sectors respectively.

d_1, d_2, d_3 are then the population multipliers resulting from basic employment.

This formulation brings into focus a neglected aspect of urbanisation until now: the role of the tertiary or service sector in the generation of urban employment and population. The justification for this neglect is essentially the idea that all tertiary sector employment is derived from the demands of agricultural and manufacturing activities. This assumption is now relaxed and the tertiary sector can now have at least some component of "basic" employment.

Equation (6) merely says that each type of basic employment adds a layer of urban population which is additive. Interactions

between the P, S and T are ignored by definition since they constitute "basic" or "export-based" or "exogenous" employment. In the primary sector all male agricultural employment is regarded as basic employment. Two variables are used for each of the secondary and tertiary sectors. LFACT is total employment in the factory sector. This may be regarded as exogenous since this is employment in only the larger factories, defined as those employing more than 10 employees if using power and more than 20 if not using power. These cut off points are, in reality, quite low: it would be more correct to use higher cut-off points on the argument that it is the larger factories which exhibit economies of scale and are therefore "more exogenous". Mera suggests construction of another variable to get around this problem. The objective is to purge LFACT of that factory employment which is not basic, i.e., that which is derived. If it is assumed that the State which has the lowest proportion of LFACT has only derived factory employment, this proportion would be necessary in all the other States for local consumption purposes. The excess over this proportion then comprises "basic" or "export" employment (LFACMX) in all other states. For the tertiary sector, government employment is regarded as basic and the two measures used are State Government employees and Central Government employees.

Three different measures of urban population are used as the dependent variable in order to investigate the functions of

different sizes of cities. First is URBPOP, the total urban population; second is CLASS-I which is the population of cities over 100,000 only; and the third is NONCLASS-I which is merely (URBPOP-CLASS-I) i.e., the total population of small towns.

As was suggested in Section I, it is expected that the size and distribution of urban population in small towns is likely to be determined by agricultural demand (or agricultural employment) while that of large cities is expected to be uncorrelated with agriculture.

Table 10a gives the regressions for URBPOP. Once again the different variables are introduced separately first to test for collinearity effects that may arise when they are combined together in one regression. Agricultural employment is common to all the regressions reported. The coefficient of LAGRM is quite unstable over the 7 regressions, suggesting high correlation (0.72) with State government employment (LGOST). Its correlation with Central Government employment (LGOCT) is also high (0.66). This suggests the derived nature of government employment. Indeed, a comparison of regressions (1) and (4) shows that the addition of LGOCT adds nothing to the level of explanation provided by just agricultural and factory employment. Indeed, the correlation of government employment, both central and state is even more highly correlated with LFACT. Note that in equations where there is no LGOST and when the coefficient of LAGRM is statistically significant, it is also quite stable at about 0.4. This means that about 5 agricultural jobs generate

about 2 head of urban population. Using a participation rate of about 35-36%, this means that it takes about 7 agricultural jobs to generate 1 urban job. The coefficient of LFACT varies between about 8 and 12 and that for LFACMX between 6 and 10. Accounting for the correlation with government employment, one can say that every basic manufacturing job induces an increase in urban population of about 8 to 10 or that it induces 3 to 4 other jobs.

It is interesting to see that contrary to expectations central government employment appears to be almost totally derived: its coefficient is unstable and not statistically significant. Surprisingly, state government employment continues to be significant when included in an equation with agricultural as well as factory employment. The population multiplier for state government employment may be as high as that for LFACT, that is between about 8 and 10. Note in Table 10a that regression (1) is not improved on significantly by the addition of government employment. It would then be reasonable to conclude that it is essentially agricultural and factory employment that is basic while government employment is derived from these activities.

Table 10b gives the same results for CLASS-I cities only i.e., the determinants of population in large cities. The first thing to note is that the significance of the coefficient of agricultural employment declines, as does its magnitude. It is now about 0.15. This means that it takes about 6-7 agricul-

Table - 10(a)

THE DETERMINANTS OF URBAN POPULATION IN(1) INDIAN STATES

Dependent Variable: URBPOP

| Independent Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|------------------|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|
| Constant | -1687 (1.72) | -924 (0.66) | 1253 (0.84) | -1701 (0.90) | -409 (0.22) | -2812 (1.42) | -935 (0.52) |
| LAGRM | 0.414 (6.26) | 0.046 (0.42) | -0.166 (1.61) | 0.425 (3.68) | 0.124 (1.15) | 0.440 (3.03) | 0.127 (1.11) |
| LFACT | 12.16 (11.43) | | | 12.40 (4.90) | 7.50 (4.33) | | |
| LGOCT | | 29.70 (7.97) | | | -0.74 (0.11) | | 6.49 (0.90) |
| LGOST | | | 16.55 (10.24) | | | 7.78 (3.21) | 9.63 (4.32) |
| t | 1084 (3.07) | 1698 (3.81) | -567 (1.26) | 1073 (2.88) | 228 (0.55) | 1852 (4.74) | 452 (0.98) |
| R ² | 0.881 | 0.801 | 0.859 | 0.881 | 0.907 | 0.854 | 0.902 |
| R ² (Adjusted R ²) | 0.871 | 0.785 | 0.848 | 0.868 | 0.897 | 0.838 | 0.891 |

Notes :

1. No. of observations in all regressions. 41
13 for 1961 (Punjab and Haryana taken as one State in 1961)
14 for 1971
14 for 1981

2. t statistics in parenthesis.

tural jobs to induce an increase in large city population of 1 or that it takes about 15-20 agricultural jobs to create the demand for 1 job in large cities. The coefficients for LFACT and LFACMX are quite stable, large and significant as expected. Every factory job creates 2 to 3 jobs in large cities. Note also that the coefficient of central government employment (LGOCY) is significant at the 5% level in regression (2) and of sizeable magnitude, quite similar to that of LFACT. This suggests that central government jobs are largely located in large cities and they do have a multiplier effect. The coefficients of LGOST are of about the same magnitude as they were in the URBPOP regressions. Regressions (5) and (6) are for 1961 and 1971 data only and use yet another measure of manufacturing employment. This is LMNHM, male employment in non-household industry. This includes all manufacturing except household industry and is therefore not an adequate representation of basic manufacturing employment - its coefficients being smaller than those for factory employment are consistent with this idea.

Table 10c reports similar estimates for small towns. The first feature to note is the consistently significant coefficient of male agricultural employment (LAGRM) and of a stable magnitude. About 9 to 10 agricultural jobs give rise to 1 job in a small town. This suggests that in the absence of any factory employment, the level of urbanisation in an exclusively agricultural economy should be in the region of about 10 per cent. This is not very far from the lowest levels that are observed

Table - 10(b)THE DETERMINANTS OF URBAN POPULATION IN (2)INDIAN STATES

Dependent Variable:
CLASS I

| Independent Variables | All Years 1961, 1971, 1981 | | | | 1961 and 1971 only | |
|-----------------------|-------------------------------|-----------------|------------------|-----------------|-----------------------|------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Constant | -2613 (2.12) | -3439 (2.72) | -1569 (1.43) | -2088 (0.52) | -1135 (1.17) | -648 (0.61) |
| LAGRM | 0.118 (1.57) | 0.146 (1.57) | -0.079 (1.24) | -0.60 (0.92) | 0.075 (1.32) | -0.072 (1.14) |
| LFACT | 8.31 (5.02) | | 5.64 (5.54) | | | |
| LFACMX | | 7.14 (3.99) | | 5.34 (5.62) | | |
| LMNHM ¹ | | | | | 4.40 (5.17) | 3.36 (5.72) |
| LGOCT | 4.20 (0.94) | 8.05 (1.78) | | | 2.95 (0.82) | |
| LGOST | | | 6.82 (4.79) | 9.63 (4.32) | | 5.75 (3.20) |
| t | 1030 (4.22) | 968 (4.13) | 217 (0.89) | 443 (1.69) | 315 (1.10) | -314 (1.06) |
| R ² | 0.900 | 0.898 | 0.938 | 0.939 | 0.924 | 0.948 |
| R ² | 0.889 | 0.890 | 0.931 | 0.932 | 0.910 | 0.938 |
| No. of observations | 41 | 41 | 41 | 41 | 27 | 27 |

Notes :- 1. Data not available yet from 1981 Census.

2. See Table 10a.

Table - 10(c)

THE DETERMINANTS OF URBAN POPULATION (3)
IN INDIAN STATES

Dependent Variable: NONCLASS I

| Independent Variables | All Years 1961, 1971, 1981 | | | 1961 and 1971 only | | |
|-----------------------|----------------------------|-----------------|-----------------|--------------------|-----------------|------------------|
| | 1 | 2 | 3 | 4 | 5 | |
| Constant | 912 (0.81) | 627 (0.56) | 1160 (0.90) | 1153 (0.94) | 859 (0.80) | 1672 (1.15) |
| LAGRM | 0.306 (4.45) | 0.294 (3.58) | 0.203 (2.73) | 0.187 (2.41) | 0.255 (4.05) | -0.011 (0.13) |
| LFACT | 4.09 (2.71) | | 1.87 (1.57) | | | |
| LFACMX | | 2.87 (1.82) | | 1.26 (1.12) | | |
| LMNHM ¹ | | | | | 4.35 (4.65) | 0.92 (1.13) |
| LGOCT | -4.95 (1.20) | -1.56 (0.38) | | | -9.66 (2.45) | |
| LGOST | | | 0.96 (0.58) | 1.18 (1.20) | | 4.67 (1.95) |
| t | 42.4 (0.19) | 293 (1.32) | 10.8 (0.04) | 8.96 (0.03) | -49.3 (0.17) | -427 (1.04) |
| R ² | 0.672 | 0.638 | 0.661 | 0.650 | 0.763 | 0.743 |
| R ² | 0.635 | 0.598 | 0.624 | 0.612 | 0.720 | 0.696 |
| No. of observations | 41 | 41 | 41 | 41 | 27 | 27 |

Notes: 1. Data not available yet from 1981 Census
 2. See Table 10a.

internationally as well as in India's most backward regions. The coefficients of LFACT and LFACMX are seen to decline in size as well as insignificance level. It is noteworthy, however, that the more inclusive measure of manufacturing employment LMNHM essentially retains its magnitude and significance. It would seem that central government employment is not important in small and medium towns. The negative sign implies that most central government employment goes to large cities and perhaps attracts population out of small and medium towns: this argument cannot be taken too far since the coefficient is not statistically significant. State government employment continues to be significant but is highly correlated with agricultural employment - suggesting that state government employment is essential servicing agriculture.

What emerges from these results? First, the level of explanation is surprisingly high. About 90 per cent of the variance in urban population as well as that of large cities is accounted for by these formulations. The variance of small town population is not as well explained but still quite respectable with R^2 in the region of 0.65. That large cities are not intimately connected with their hinterlands is supported by these results. Factory employment has multipliers of about 3 to 4. Government employment is largely derived from the demands of the primary and secondary sectors: it does not appear to be autonomous or exogenous. In trying to explain government employment, it was regressed against agricultural and manufacturing employment. (regressions not reported here). About 90

per cent of the variance is explained. About 75 agricultural jobs create 1 central government job while only about 25 jobs create 1 state government job. Similarly, 3 factory jobs create 1 central government job but 2 state government ones. Small towns are more organically connected with agriculture and the employment within them is essentially for the service of agriculture. Government employment has been found to be almost totally derived: it is clearly not autonomous.

In comparing the actual urban, large city and small towns populations with predicted ones, it is found that Orissa was seriously lacking in adequate small towns populations, as well as Maharashtra. Bihar and Madhya Pradesh are found to lack adequate large city population. These results are suggestive of methodology that could be used for regional investigations in order to determine whether the lack of different sized towns is warranted or not.

IV. Urbanisation in Indian States : An Interpretation

The statistical results found in the simple estimations attempted have been found to be surprisingly good and consistent with the theory offered in Section I. The pattern of urbanisation in India is clearly not chaotic: it is much as would be expected from theory in most states. This is somewhat surprising since the regularity of pattern is not obvious at first glance. If the kind of simple equations used are regarded as good forecasting equations, such a system of equations could even be used for forecasting and planning purposes. The prediction

of intra-national or inter-regional growth rates of urbanisation has never been regarded as easy. An enlightened use of these estimation procedures could be quite useful.

As predicted there is a tight relationship between levels of urbanisation and economic development. The surprising feature of the estimations is that the peak effect of income on urbanisation is found to be at quite low income levels and is in fact found within the sample of Indian States. This result is unexpected since the use of international data would suggest this turning point to occur at much higher income levels. The only interpretation that can be offered here is that the effect captured is a *ceteris paribus* effect: this is the pattern of the effect of income on urbanisation when the structure of employment does not change appreciably. This happens when overall income increases because of industrial growth unaccompanied by matching changes in the agricultural sector i.e., the familiar dualistic pattern. This may be the case in the more industrialised states in the country: Maharashtra, Tamil Nadu, West Bengal and Gujarat. All have experienced a significant deceleration in their rates of urbanisation except for Gujarat and all have experienced stagnating agricultural productivity. Their historically high industrialisation and urbanisation levels were clearly not due to intrinsic forces of urbanisation and economic development but because of the demands of the colonial system.

More light is shed on this issue by the effects on urban population of basic employment. It is of great interest to see

that agricultural employment essentially only creates demand for services and industry in only small and medium towns. The population of large cities has little relationship with agricultural activity except in an indirect fashion through general income growth which creates demand for urban goods. Hence in the situation of countrywide agricultural stagnation as was the Indian experience in the 50-100 years before independence, the small amount of urbanisation that took place had to be "exogenous" based on colonial trade patterns. The great policy relevance of these findings is that the growth of small and medium towns is likely to be brought about by agricultural growth in the backward regions rather than industrial dispersal. The highly significant effects of factory employment on the generation of population in large cities would suggest a policy of industrial dispersal to existing large cities which may be somewhat industrially backward. Or, alternatively, it suggests the creation of new centres which will be of substantial size. There should be a dispersal of concentrations rather than a dispersal of concentration.

The idea that economies of scale that exist in manufacturing cause the formation of concentrations is supported by the large population and employment multipliers found for factory employment. One of the key drawbacks in the work reported in this paper is the lack of a good indicator of "basic" tertiary sector employment. It is of great significance that government employment can largely be explained by basic agricultural and factory employment. The size of government is then not as

exogenous as is often thought: it is therefore not easy to trim it.

The consistent story that emerges from the estimations in this paper is then as follows. Increases in income do lead to higher urbanisation levels. This is because of the diversification of activity that usually accompanies growth in incomes (because of Engel demand effects, etc.). If this diversification does not take place, the urbanisation accompanying it would be slower than otherwise. Many of the non-agricultural activities exhibit economies of scale: these determine the sizes of settlements that follows. The distribution as between large, medium and small towns is therefore determined by the distribution of economic activities. The number and distribution of small towns is particularly linked tightly with the level and distribution of agricultural activity. The hierarchy of economies of scale found in the manufacture of different products along with the agglomeration economies as revealed by manufacturing employment multipliers presumably then determines the hierarchy of the size of settlements. Layers of urbanisation are cumulatively added on by the different basic activities.

This interpretation attempts to link the overall theory of urbanisation and economic development as captured in a structural model of the kind sketched in Section I with the Central place theories of the distribution of settlements and the "economic base" theories for the size of a settlement. These explorations suggest that spatial sub-models can be grafted on to such

countrywide sectoral models. The total agricultural employment, for example, as determined by such a model, could be used, in a sub-model, to generate one layer of urbanisation - the small and medium towns. Total manufacturing employment, similarly, could be disaggregated and then used to generate the larger order settlements - and so on.

It is, perhaps, appropriate to conclude with a key policy implication of the findings in this paper. It is the growth of agriculture in the backward regions and specifically the whole Eastern region which needs the highest attention. This essentially means that technological innovations in rice and dry area crops need the greatest research inputs. This agricultural stagnation in the Eastern region is largely responsible for the increasing regional disparity in the country. The redressal of this disparity in agriculture is also, incidentally, the best policy for balanced urban growth. The focus on regional dispersal must be more on agricultural technology and less on manufacturing.

Appendix-ITable A.1URBAN POPULATION OF STATES¹ IN INDIA1951-1981

(In thousands)

| State | Population of All Towns | | | | Population of towns above (20,000)(Class I,II,III) | | | |
|--------------------|-------------------------|-------|--------|--------|---|-------|-------|--------|
| | 1951 | 1961 | 1971 | 1981 | 1951 | 1961 | 1971 | 1981 |
| Andhra Pradesh | 5419 | 6275 | 8403 | 12458 | 3358 | 4732 | 6942 | 11312 |
| Bihar | 2624 | 3914 | 5634 | 8699 | 1898 | 3023 | 4529 | 7634 |
| Gujarat | 4429 | 5317 | 7497 | 10556 | 2978 | 4212 | 6009 | 9060 |
| Haryana | 968 | 1308 | 1773 | 2822 | 617 | 950 | 1394 | 2321 |
| Karnataka | 4452 | 5266 | 7122 | 10711 | 2593 | 3669 | 5319 | 8870 |
| Madhya Pradesh | 3135 | 4627 | 6785 | 10589 | 2008 | 3141 | 5097 | 8170 |
| Maharashtra | 9201 | 11163 | 15711 | 21966 | 6623 | 9398 | 13961 | 20225 |
| Orissa | 594 | 1110 | 1845 | 3106 | 303 | 618 | 1317 | 2367 |
| Punjab | 1990 | 2568 | 3216 | 4620 | 1329 | 1940 | 2510 | 3742 |
| Rajasthan | 2955 | 3281 | 4544 | 7140 | 1646 | 2173 | 3321 | 5611 |
| Tamil Nadu | 7334 | 8991 | 12465 | 15928 | 3916 | 7090 | 10846 | 14446 |
| Uttar Pradesh | 8625 | 9480 | 12389 | 19973 | 5928 | 7853 | 10479 | 15288 |
| West Bengal | 6270 | 8541 | 10967 | 14433 | 5640 | 7793 | 10140 | 13761 |
| India ² | 61629 | 77566 | 106902 | 156192 | 43169 | 61418 | 89607 | 134898 |

Notes : 1. Including all states with total population greater than 10 million in 1971 but excluding Kerala and Assam.

2. Including all states except Assam and Jammu & Kashmir.

Source : Census of India 1981 - Provisional Population Totals - Series I - Paper 2 of 1981.

Appendix-IISources of Data

| <u>Variable Name</u> | <u>Source of Data</u> |
|----------------------|--|
| 1. URBPOP | |
| 2. CLASS I | |
| 3. NONCLASSI | <u>Census of India 1961, 1971, 1981</u> |
| 4. LAGRM | |
| 5. LMNHM | |
| 6. S.D.P. | Centre for Monitoring the Indian Economy: |
| 7. VAFAC | <u>Basic Statistics Relating to the Indian Economy</u> Vol.II.1981 |
| 8. FGNS | |
| 9. LGOCT | Govt.of India: Ministry of Labour:Directorate General of Employment and Training <u>Employment Review (Annual)</u> |
| 10. LGOST | Various Issues. |
| 11. LFACT | Govt.of India: <u>Statistical Abstract</u> (Annual). Various Issues. |
| 12. KWH | |

BIBLIOGRAPHY

1. Ashish Bose, D.B. Gupta and G. Raychaudhuri
Population Statistics in India
 New Delhi. Vikas Publications 1977
2. Census of India 1971
 India, Series
Report of the Expert Committee on Population Projections - Paper I of 1979.
 New Delhi : 1979
3. Census of India 1971
 India, Series I, Part II (Ai)
General Population Tables
 New Delhi : 1975
4. Census of India, 1981
 India, Series I
Provisional Population Totals
 Paper 2 of 1981, Paper 3 of 1981
 New Delhi : 1981
5. Central Statistical Organisation
Statistical Abstract
 New Delhi. (Annual) - Various Issues.
6. Centre for Monitoring the Indian Economy
Basic Statistics Relating to the Indian Economy
 Volume II. States
 Bombay : 1981
7. Alan Gilbert and Josef Gugler
Cities, Poverty and Development :
Urbanisation in the Third World
 New York : Oxford University Press : 1982
8. Amitabh Kundu and Moonis Raza
Indian Economy : The Regional Dimension
 New Delhi : Spektrum Publications 1982
9. Ministry of Labour : Directorate General of Employment and Training
Employment Review (Annual)
 New Delhi. Various Issues

THE INFORMAL SECTOR IN DEVELOPING COUNTRIES -

A MACRO VIEW-POINT

Sarathi Acharya*

Introduction

Most countries in the developing world have experienced a disproportionate rise in their urban population, urban poverty and underemployment in the last few decades.¹ Large sections of this population are concentrated in slums and shanty towns and are engaged in a number of irregular occupations. These people and their engagements have been popularly termed as the 'urban informal sector'. A major debate has emerged over the last decade about their independent existence, partial integration or total integration into the dominant macro-economic systems of these countries. It is also contested whether the relationships between the formal and the informal sectors are exploitative or benign.² The purpose of this paper is to deduce an alternative definition of the informal sector, make a case to study the informal sector as a continuum of the so called formal sectors, and finally, reflect upon the process of capital accumulation in these countries as it has emerged through a juxtaposition of the formal and the informal sectors. In the next section we evolve a definition; in section 3 a typological exercise is attempted for showing the formal-informal linkages; and in the last section some hypotheses on the capital accumulation processes are described in light of the different economic formations in the developing countries, where the informal sector forms an

* Indian Council of Social Science Research, New Delhi.
I am grateful to Zofia Kozak and Harsh Sethi for their comments.

important segment. The main evidences in the paper are based on a series of case studies from India, though the arguments presented draw upon global literature.

On Definition

Statistics reveal that in large urban conglembrates like Bombay, Calcutta, Jakarta, Mexico City, Nairobi and Sao Paulo more than fifty per cent of the population is engaged in unorganized sectors and household production and services organizations where there eixst no wage or work hour regulations (ILO 1972; Kowaric (undated); Lubell 1974; Sethuraman 1976a). In spite of this deprivation, this section of the society is expanding faster than the total urban population which in turn is growing at a higher rate than the overall population of these countries (World Bank 1975; GOI 1981). It is also observed that their contribution to the national income is signficant and at least in the case of India the so called non-corporate, non-factory sector production is at par with that of the organised sector.

Open unemployment measured in time units in developing countries is relatively insignificant, ranging between five and ten per cent, showing that most persons of all ages and sexes have something to do (Seal 1980). But since the poverty levels are quite high (Ahluwalia et al 1978), the large underemployment raises a semantic question of the definition of urban workers and their activity. To begin with, we introduce two interrelated concepts familiar in the literature, namely, the urban informal manufacturing and services sector, and the urban informal labour market.

The urban informal sector has been identified by several characteristics which are often coterminous (Sethuraman 1976b).³ The first characteristic is the small size of the units (Weeks 1975). But size alone is an insufficient identification as there is neither a justification to segment the size continuum nor do the low productivity or underemployment associated with the small size, follow a universal pattern. The second characteristic cited is the non-corporate family type ownership (Papola 1980), though this too is inappropriate, as some of the largest enterprises in India are owned by individual families. A more realistic characteristic is the relatively low order technology that universally prevails in these sectors (Joshi and Joshi 1976). The technology is capital scarce and at times the unit survives sheerly due to low wages. An important characteristic identified is marketing. The informal sector operates in a highly competitive market and often has to sell goods and services at unfavourable prices against an inequitious competition from the organized industries which form price cartels due to their monopolistic and oligoplistic positions (Sethuraman 1976b). Fifthly the informal sector has no access to public facilities and state patronage like bank credit, electricity and water (Weeks 1975) and may either have to pay extra amounts for the same or enter into clandestine arrangements with various agencies for this purpose. In fact an interesting observation is that the formal sector itself promotes illegal activities in the shanty towns.⁴ The sixth feature of the informal sector is the absence of wage regulation and work-regulation and wide prevalence of self and casual employment. Every worker has something to do, implying that entry into the labour market is near automatic (Papola 1980). But

it has been found in some studies that the informal sector itself is a multisegmental system with its own laws of entry and exit into the labour market (Bremen 1976, Standing 1977) and even if the entry may be easy, the fresh entrants may be entrusted with the most menial work (or even be forced into prostitution).

Studies on the informal labour market have been concerned with two groups of inquiry, namely, the rural to urban migration - about the origin of workers migrants, their age-sex composition, earnings and stability of jobs (Connell 1978, Greenwood 1971), and the nature of the segmentation of the labour market and the determination of unemployment (Bremen 1976, Hauser 1974, ILO 1972, Joshi and Joshi 1976). These studies indicate that the informal labour markets can be classified into a fourfold framework. These are : (a) The segmented labour markets, where there is vertical/spatial labour immobility; (b) Institutional labour markets where the employment and wages are determined predominantly on caste, social status and similar criteria; (c) Subsistence type, where a primitive economy prevails; and (d) Neo-classical type, where there is smooth employment-wage adjustment.⁵ The first three categories dominate as against the fourth. A number of studies show that there is little unemployment and the concern expressed is more upon degrees of poverty, productivity levels and exploitation.⁶

It follows from the preceding arguments on the informal sector concepts and the labour market classifications that the concern of both these inquiries is towards the working poor, as to who they are, what they do, etc. From a macro viewpoint

one is therefore, in a position to treat the informal sector and the informal labour market as a single conceptual category of the working poor which includes petty producers, artisans, small retailers and a large number of other undefined workers who are in self-employment or otherwise.⁷ They fall outside the Governmental regulations of employment and wages and operate in low order techno-economic formations, with skills acquired from outside the formal training systems.

Such a definition has been subjected to criticisms for being two 'vague' and not permitting to separate out homogenous analytical categories. A whole issue of the 'World Development' 1978 was devoted to such discussion. But to explain the informal as an integral part of the economy, and in turn depict the process of its growth and perpetuation, such a broad based classification is deemed necessary.

Economic Linkages of the Informal Sector

There exist both forward and backward linkages of the informal sectors with the formal sectors, which have been termed as exploitative by some authors (Leys 1973, Bienefeld and Godfrey 1978) and benign by others (Papola and Mathur 1980, ILO 1972). The predominant concern of most studies have been to establish enterprise-enterprise relationships (Watanabe 1978, Middleton 1981, Harris 1982), but the broad based definition of the last section warrants more disaggregated empirical categories. The two forms of economic activity, namely, production and marketing can be sub-divided into several processes which reflect a juxtaposition of the formal and the informal sectors. They are described in turn.

Production Linkages

A large number of big corporations, both in the national and the international sectors, subcontract part of their activities outside their own enterprises to small and tiny units. It is cheaper to have the work done outside the formal sector in cases where there are no economies of scale. This is not uncommon in developing countries, as much of the technology and/or product composition permit little room for economies except by wage reduction. The different studies on the economies of scale (Sardesara 1980) and occupational wage disparities across different sizes of firms in Indian industry (Bose 1980, NFC 1977) are witness to these aspects. Typical examples of subcontracting are found in the mechanical engineering industries, food processing, electrical and electronic industries, garments, textiles and furniture manufactures amongst others (Watanabe 1978, Papola and Mathur 1980). To quote from a recent study by Harris (1982) for South India, "Durairajan owns a company producing a range of small machine tools.... he is also encouraging some of the experienced workers from the machine shop to leave and set up their own small workshops. He has helped those who have agreed to do this by selling them second-hand machinery at book value and by giving them orders to work.... he has been able to reduce the costs of production of the small drilling machines for which his company first established its reputation through lowering labour costs.... by having got rid of some workers who, whilst having valuable experience and skills, were also leading trade union members and at least potential 'trouble makers'". Similarly, a leading tractor manufacturer in North India has proclaimed that he subcontracts and buys parts from as many as a thousand small ancillary units

and thus provides employment and entrepreneurial opportunities to several thousand people. What he in effect gains are cheap semi-finished goods and services of trade union free labour.

In a study of the light industry in Western India, Streefkerk (1981) writes, "A number of industrial firms in Balsar are closely associated with larger industrial concerns.... we might speak of the integration of modern light firms into the industrial structure; an integration marked by a social and economic subordination with respect to the larger concerns. This association allows these latter firms to supply themselves with relatively cheap parts and to contract out certain phases of the production process." Subcontracting has another exploitative element. Large manufacturers often delay payments, causing interest losses to their junior partners. The money borrowed by the latter is from private money lenders at rates much higher than the bank rantes. As a result the workers get paid less and irregularly.

A form of exploitative bondage of the informal sector with the formal sector in a food processing industry (cashew) has been studied in Kerala by Kannan (Kannan 1978, Kannan 1981). It has been observed that cashew processing is sublet to the 'cottage' sector (illegally) from the factory sector where there is no wage regulation or trade union. In addition there has been a constant flight of capital to the adjoining state of Tamil Nadu, since there is no wage regulation enforced in Tamil Nadu and labour is drawn from the informal market at a wage rate which is about 38 per cent of the minimum legislatively fixed wage in Kerala.

Casual labour is employed by large factories and enterprises on a contract basis along with regular workers with differential wages and no commitments to any other facilities like medical benefits, pension etc. This is a common practice by construction companies and industries where the demand for labour may vary seasonally or as per the supply of raw materials from agriculture, like sugar mills or textile mills. In a detailed study of the construction industry in Ahmedabad city, Subramanian et al (1979) writes "The system of labour contracting thus characterizes an important feature of the labour supply in the construction labour market. The most common method is wherein the building contractor himself provides the materials and most of the employment required for some part of the task and pays the subcontractor for carrying out the work.... The rate of payment indeed is determined by the market forces of demand for and supply of specific skills and is found to vary from 10 per cent to 20 per cent of the wage rates." (Ibid, p.45-46) The predominance of the unorganized labour engagement in the construction industry is evident from the following table where the role of the official Employment Exchange and the Trade Unions is nil.

Table 1 : Distribution of Workers and Sources of Present Jobs

| Sources of Present Jobs | Total Workers (%) |
|-------------------------------------|-------------------|
| 1. Own Efforts | 13.8 |
| 2. Labour Contractors' Efforts | 73.7 |
| 3. On Introduction by Other Workers | 9.7 |
| 4. Through Employment Exchange | 0.0 |
| 5. Through Labour Union's Efforts | 0.0 |
| 6. Relatives' Efforts etc. | 2.8 |
| Total | 100.0 |

Source : Subramanian et al (1979), p.99.

In this study it is also stated that the average wage of an unskilled worker is Rs.6.1 while the minimum wage legislation had prescribed a wage rate of Rs.7.30. The author writes that it is revealing to find that the average wage rates of some occupations, especially the unskilled, prevailing in the building construction in 1977-78 were much lower than that prevailed in the organized industries in 1971-72. It is further noticed that the informal sector too has regular and casual workers and the latter is paid lesser than former even though the nature of the job they do is not dis-similar. The table below shows that about 60 per cent of the casual workers earn between Rs.61.90 per month while only 25 per cent of the regular workers fall in that income category. On the other hand more than 22 per cent of the regular workers earn above Rs.200 per month while the casual workers in that income range are less than 9 per cent.

Table 2 : Distribution of Workers by Earnings and Work Status

| Respondent's Average Earnings (In Rs. Per Month) | Workers by Status | |
|---|-------------------|-------------|
| | Casual (%) | Regular (%) |
| 61 - 90 | 59.0 | 25.1 |
| 91 - 150 | 26.7 | 42.1 |
| 151 - 200 | 5.3 | 10.6 |
| 201 + | 8.9 | 22.1 |

Source : Condensed from Subramanian et al (1979), p.161.

A common form of attachment of casual labour to the organized sector manufacturing business, found in two entirely different industries and in two geographically distant areas, is the under-reporting of the size of labour force employed. Streefkerk (1981) states that in the light industry in western India, it is in the

interest of the proprietors to keep the number of workers low on paper, so as to economize on labour costs. They are thus able to keep wages of the unreported workers low and irregular and lengthen their working hours beyond 8 hours a day. A large number of workers are also kept on a temporary status by following the practice of breaking the service-length of the employees after 240 days and reemploying them after a few days. In temporary workers are not covered by labour legislations. The Maharashtra's engineering industry approximately 100,000 workers are said to be unprotected by labour legislation. Their wages are low, working hours are long and there are no paid holidays or bonuses. Similar practices are prevalent in the garment export industry in Madras as well (Kalpagam 1981). In addition, Kalpagam also finds that units split their processes like stitching, sewing etc. in different places and declare them as separate units. The size of each unit is thus reduced, so as to fall outside the 'factory sector' and avoid the labour regulations statutory in the factory sector. Each of these 'sub-units' employs labour on ad hoc piece-rate basis which cuts down the labour costs.

The informal sector linkage is found in the textile industry too where there are a number of categories of workers are employed, namely, permanent workers, temporary workers, 'badli' workers etc. The word 'badli' virtually means 'interchangable' or temporary, and these workers are drawn upon when their services are needed. Their status is similar to casual workers, who do not belong to trade unions and do not avail the usual corporate sector advantages. Yet another form of production linkage is the employment of cheap manual transport facilities (human or animal pulled trolleys) for hauling semi-finished industrial goods or raw materials of the

corporate sector on a 'piece-rate' basis. The whole business is on a contract basis and is technically outside the organized sector, thus avoiding most of the wage/work regulations, and the earnings are at subsistence or even below it. The same operations conducted by the formal sector would have to be done on 'time-rate' payments and at much higher wage levels.

Waste re-cycle of industrial and household waste is often done by casual labour engaged in scavenging operations. These workers, mostly women and children, separate out metal pieces, rags, plastic products, cork, wood pieces etc. and re-cycle them into industrial production at lower cost than those incurred when the same operation is conducted by the formal sector, and which may involve large capital outlays and higher wages due to unhealthy working conditions. This is, yet another linkage of the informal sector with the formal sector.

Marketing Linkages

Marketing linkages of the informal sector with the formal sector fall in two neat divisions. Each of these depict an unequal relationship between these sectors, which is evident from the fact that, had these operations been conducted by the formal sector, the cost would be higher and its incidence would fall upon the formal sector itself.

A large number of commodities produced in the informal sectors are marketed by the formal sectors at considerable profit for the latter, while the wages in the former are at subsistence. This is typically true for those commodities which do not require sophisticated technology, are produced by individual craftsmen or by small

groups of traditional workers who use their own indigenous means of production and are in no position to reach the consumers of their products directly. Formal sector marketing agencies sometimes commission work or in other cases just buy off the products from the workers and sell them at many fold the price they pay to the workers, to the upper echelons of the society or in the international market. This control of the market by a few marketing agencies ensures backwardness and poverty among the traditional workers, thereby denying them the possibility of a technological change or innovation at the production process and a high marketing surplus is siphoned off. The industries where such practices are dominant are, foot-wear and leather work, textiles, garments, handloom and handicraft, metal-ware, carpets, wood-work, etc. Recently, the Planning Commission of India commissioned a series of studies on such practices, and they provide a data base for studying the process of production, marketing and surplus accumulation. To quote, the project director, Singh, in one of the studies on 'Chikan' garments in Lucknow ".... the working of the market is such that the producer-organisers' surplus has grown while the workers' earnings and share in the produce have dwindled.... the concentration of riches in the hand of a few and deprivation of the mass of workers both result from the growth of craft taking place in the framework of the market processes."
(Singh et al., 1975a, p.4-5)

In all the six studies conducted by Singh and his team more than 60 per cent of the workers earn less than Rs.40 per month, which is below the poverty line at 1975 prices. Based on a sample of 1029 workers for the Chikan study, Singh says that "The picture is one of trader-contractors and other middlemen dominating the

production and trade in the Chikan Embroidery Craft. Our field observations of this survey reveal that the former moneylender, now turned into a producer-trader, dominates the craft and market for its goods. There is, in addition, a chain of contractors and other middlemen in between the producer-trader and the craftsmen." (Singh *et al.*, 1975a, p.19).⁸ The following table provides the price paid for selected items when the product passes on from the contractor to the consumer (The margin between the worker and the contractor are not provided in the study from which this data is drawn).

Table 3 : Rates of Payment per 100 Units of Different Products by Agencies Commissioning the Work

| Products | Agency and Its Respective Margin | | | |
|-----------------------|----------------------------------|--------------|--------------|--------------|
| | Consumer Purchasers | Whole-salers | Coopera-tive | Contract-ors |
| 1. Big Kurta | | | | |
| Rough | 141.18 | 72.90 | - | 54.25 |
| Fine | 285.38 | 263.08 | - | 135.47 |
| 2. Small Kurta | | | | |
| Rough | 158.75 | 53.46 | - | 42.42 |
| Fine | 262.50 | 135.00 | - | - |
| 3. Saree | | | | |
| Rough | 1290.91 | 651.88 | 800.00 | 649.51 |
| Fine | 3925.00 | 2501.16 | - | 1590.29 |

Source : Singh *et al.*, 1975a.

Most workers are not paid in advance and even deductions are made on slight pretension.' In certain cases in the Mirzapur Carpet Industry (Singh *et al.*, 1975b) the contractor-traders pretend to be producers since they place the orders and even engage wage employees on piece-rate wages, but in effect their role is no different from marketing agents.

In a detailed analysis of the coir matting industry in Kerala, Isaac (1982) finds that industrialists have turned to pure marketing operations over the last 20-30 years as there has been a gradual shift from factory production to handicraft production. The erstwhile industrialists maintain a stronghold over the market and prices. The technology is traditional and the surplus is sustained (or increased) only by lengthening the working hours. The wages in the organized sector increased by about 50 per cent in the between 1960-70, the same in the unorganized sector stagnated at about half the absolute value over this period. Similar processes can be identified in the shoe industry of Agra and Kanpur or the garment export business in Bombay and Delhi.

Informal sector is also used for marketing commodities produced in the formal sector at costs much lower than the marketing costs of the formal sector. This process saves the cost of marketing for the large producers or wholesale dealers, since the cost of labour is cheap. It is a common sight to observe very small retail outlets, pavement retailers or travelling salesmen selling bottled drinks, cheap quality mill produced textiles, cheap garments and wool-ware, eatables packed by large industries, plastic-ware, old stocks of consumer manufacture etc. The case of newspapers/magazines delivered at homes or sold on streets by small boys, too is a case of avialance of cheap marketing facility by the publishers/distributors. There are no direct surplus calculations for such operations available, but the fact that the commodity, whether sold by the vendor or departmental store, is priced the same, and that the wage of the workers in the latter

is low, implies that the amount the producer pays to the departmental store as commission is lessened by employing informal sector labour.⁹

From these typologies it is evident that the informal sector is an indefinite source of cheap labour which is used for capital accumulation by the formal sectors through established linkages. The typologies developed are by no means exhaustive, and they also indicate a wide heterogeneity in the informal sector, but they do help establish one of the means of surplus accumulation in the developing economies, i.e. by exploitation of cheap labour. Lewis had framed a theory of growth based on availability of cheap labour in his celebrated thesis of unlimited labour supply in the fifties but he had also implicitly envisaged a continuous technological change which would push the productivity curve upwards, and explicitly stated that the surplus would be increasingly invested back for production. However, the present reality states none of these premises to hold. This is further discussed in the next section.

On Understanding the Informal Sector

The classical theories of development look at the informal sector as essentially being transitory, and over time with technological and market imperatives this sector would merge into the large scale modern sector (Sjuberg 1965, Emmerij 1974). Many empirical studies have been conducted to compare the European or American levels of development of several decades back with that in the present day developing countries to adjudge the labour market and economic activity but none of them have proved to be conclusive (Morley and Williamson 1977). On the contrary, present

data shows a considerable rise in this sector both in its size of production and the number of persons engaged. There is further evidence to show that there is no transition in the informal sector workers (and units) and their growth curve is horizontal with respect to the size, real earnings or the system of activity (Mazumdar 1976, Papola 1981).

The other explanation is one which considers dualism in the economy to be a given phenomenon. It is stated that there is the modern sector with high technology, rational organisation, regulated wage/work and a highly restricted entry into the labour market, and there is the informal sector where there is easy labour entry, indigenous family owned resources, small scale unregulated competitive product markets, primitive technology etc. (ILO 1972, Santos 1979). The process of formation of the latter is explained by a rapid population growth, rural-urban migration and universalization of education (making rural youth misfit for agriculture). This upsets the equilibrium between the demand and the supply of labour, and due to the restricted entry into the organised labour market, it gives birth to a 'residual', called the informal sector. A solution to the growing "overurbanisation" is suggested through halting the migration, improving the condition of the working poor by suitable loans and marketing facilities, technical training and a vigorous population control (Bairoch 1973). An important omission in this approach is a neglect of the historical formation of dualism in the urban centres of the erstwhile colonies even in the periods when the population growth and migration were not significant. Further, such informal sectors are prevalent in both, the heavily populated countries of South

Asia and the sparsely populated countries of Latin America alike, questioning the population based explanations of the informal sector.

An extension of the dualistic theories of development suggest yet another approach. It says that modern industries in the third world have grown as subsidiaries of multinational corporations of America and Europe, and part of the economy enveloping these industries is integrated into the global market. The rest is the left out sector which has not had an opportunity to grow out of its low level equilibrium, is discriminated, and is poor. The modern sectors grow faster due to a plough back of the profits, and the income differentials increase. The discrimination is strengthened further by a monopolistic control of the markets by the former (Souza and Tokman 1976). This 'left-cut' sector approach has a major unanswered question, as to how a sector, which is left out of the mainstream of development, is still persisting and further expanding over four or five decades now? Logically a left out sector should have been vanquished.

The informal sector in the developing economies owes its existence to a number of historical processes and practice of policies in the contemporary period, which ensure its existence and perpetuation. It is well known that there had been a secondary sector even in the 18th and the 19th century, engaged in providing commodities to the village community and cities. But those activities were localized, with no linkages with the higher forms of economic activity. It is only by the turn of the century that the local commodity production was ruined by imports of manufactures from Europe, and the manufacturers were forced to become agricultural labourers/peasants and/or forced to migrate to cities. The excessive transfer of labour to agriculture stemmed the modern-

isation of agriculture due to a large man-land ratio and a consequent negligible surplus. On the other hand the low skilled idle labour was a convenient source of cheap work. The migrant labour took up occupations comparable to their earlier occupation in technology and social formation, but of a different market orientation. This has been described in the previous section. Since these workers carried with them their cultural heritage, the sex biases etc. and were engaged in occupations of a similar nature as before (even if their deprivation and poverty was greater), a working class consciousness did not emerge, and the labour force remained segmented. This is evident from the different studies on the socio-economic profiles of the workers in the informal sector (TISS 1982, Santos 1979, Kowaric 1976). Due to the extremely low earnings there was/is limited possibility of an independent growth through indigenous technological progress or investment in these segments.

In the post-independence period¹⁰ the development paths pursued in these countries, whether they pursued an import substitution policy or an open economy policy, heavily relied upon foreign capital and technology and the entrepreneurial capacity of the local elite. This entrepreneurial class was (and is) essentially a mixture of money-lenders and feudal elements and the establishment of a central capitalistic order was beyond their capacity.¹¹ The State policies towards the informal sector have been a combination of, halting migration, promoting intermediate technology, providing marketing facilities, fixing minimum wage laws and several other reformist policies within the existing structure of the society and economy. These were in no way helpful as the overall economic structure was unchanged and was even strengthened.

The informal sector has become an integral part of these economies and with their sudden withdrawal (a supposition) the whole system is likely to collapse. An immediate conclusion therefore is, that both wealth and poverty are created out of the same dynamics. Surplus generated by the informal sector is siphoned by the formal sector,¹² which in turn drains it abroad or spends it on conspicuous consumption, affecting the demand and commodity production structure and further distorting the income distribution. The necessary condition for the informal sector existence is the continued relative advantage the formal sector obtains by linking with the informal sector for any activity. If P_1 and P_2 are the productivities of the same operation when alternatively performed by the formal and the informal sector, and w_1 and w_2 be the wages to be paid accordingly, then the following inequality should hold :

$$\frac{P_1}{w_1} < \frac{P_2}{w_2}$$

The two circuits of an urban economy principally reflect upon the source of the growth in a developing country, as being based upon the 'absolute surplus extraction', i.e. by getting larger volume of work done for same or lesser wages. This is different from the contemporary experience in the developed western countries where the principal source of growth has been the technological progress. These statements are completely verifiable by a study of the industrial structures of the developing countries, say, India where there is a pathological dependence on foreign technology with such complete lack of innovation that even after a design is imported, the design for the same product has to be reimported after the present design is obsolete. Since

most of the technology is out-dated, informal sector linkages provide easy profit mechanisms (Chisti 1975, Patnaik 1978, Isaac 1982).

It follows therefore, that the informal sector has come to stay at its low level equilibrium with little prospect of its own development due to the absence of reinvestible surplus. The existence of the formal sector in its present shape, rests much upon the dependence on the informal sector and the vice-versa, and in this regard, they can be termed as a continuum of each other. However, there is an unequal relationship perpetuated, which is typically what we term as the distorted structure of the economy.

Conclusion

In this paper an attempt has been made to gather some field studies on the informal sector and to try to study them in the context of a macro framework. Urban poverty and underemployment reflected in the shape of the informal sector are intrinsically related to the overall economic structure of the developing countries today. A withdrawal or altered position of the poverty-ridden sectors of these economies are likely to jeopardize the existing economic mechanisms. The perpetuation of the urban poor is related on the exploitation of cheap labour in a fashion that this method assumes the most efficient process in surplus generation in the absence of a continued technological process and expanded investment in the industrial sectors. Reformist policies formulated for poverty reduction and unemployment like promotion of intermediate technology etc. often strengthen the already existing linkages that bridge the

working poor with global accumulation. In this regard it is felt that the developing countries do not face the problem of unemployment so much; their problem is the distorted structure of the economy which leads to this skewed income generation.

-Dk-

Footnotes

1. See for instance, World Bank (1981). The ILO had commissioned a number of city studies through the seventies which provide ample statistics.
2. There are three major contentions here. The benign relationship is interpreted as an advantageous one, or even as one where there is no relationship and the informal sector is an autonomous sector. The third contention is about an exploitative relationship. See Beinfeld (1975), Middleton (1981).
3. The literature on this subject has provided several characteristics. Only selected main ones are given here.
4. Sometimes when licenses are not provided to expand activities beyond a certain capacity, producers resort to such measures.
5. Rodgers (1981) provides an analytical survey of the literature.
6. See for instance, Prakash (1981).
7. Bremen (1976) has also used these two categories interchangably. He has, however, criticised this broad based definition for being too 'loose'. But his purpose was to construct profiles of migrant labour in different professions which required a finer classification of micro situations.
8. Even among the unorganised sector, Singh has recorded that there are different modes of work organisation which provide wages which range between Rs.0.24 paise per hour to Rs.2.50 paise per hour. This reflects upon the heterogeneity of the informal sector, and the lack of a link between wage and productivity.
9. An example of the use of child labour for such purposes is illustrated in ICCW (1977).
10. The reference is towards countries which achieved independence in mid-twentieth century, like India.
11. No details on this aspect are developed here, nor is a reading list provided, as this is a well debated and accepted stand.
12. Detailed history of the growth of cities in Latin America are documented in Roberts (1978). Such analytical studies are not available for Asian cities.

References

1. Ahluwalia, M.S. et al 1978 "Growth and Poverty in Developing Countries", World Bank Staff Working Paper No.309.
2. Bairoach P. 1973 "Urban Unemployment in Developing Countries : Nature of the Problems and Proposals for Solutions", ILO, Geneva.
3. Bienefeld M. 1975 "Informal Sector and Peripheral Capitalism - A Case Study of Tanzania", IDS Bulletin Volume 6.
4. Bienefeld M. and Godfrey M. 1978 "Surplus Labour and Under-employment", IDS Discussion Paper No.138.
5. Bremen J. 1976 "A Dualistic Labour System : A Critique of the Informal Sector Concept", Economic and Political Weekly, Nov. 27, Dec. 4 and 11.
6. Bose A. 1980 "Big and Small Industry", Mimeographed, Indian Council of Social Science Research, New Delhi.
7. Chisti S. 1975 "Transfer of Technology in India", Economic and Political Weekly.
8. Connell J. et al 1978 "Migration from Rural Areas", Oxford, New Delhi.
9. Emmerij L. 1974 "A New Look at Some Strategies for Increasing Productive Employment in Africa", International Labour Review, September.
10. GOI (Government of India) 1981 "Census of India 1981".
11. Greenwood M.J. 1971 "An Analysis of the Determinants of Internal Mobility in India", The Annals of Regional Science, Volume 5.
12. Harris J. 1982 "Character of an Urban Economy : Small Scale Production and Labour Markets", Economic and Political Weekly, June 5 and 12.
13. Hauser P.M. 1974 "Measurement of Labour Utilisation", Malaysian Economic Review.
14. ILO 1972 "Employment, Incomes and Equality : A Strategy for Increasing Productive Employment in Kenya", Geneva.
15. ICCW (Indian Council of Child Welfare) 1977 "Working Children in Urban Delhi", ICCW Publication.
16. Isaac T.M.S. 1982 "Class Struggle and Structural Changes : Coir Mat and Matting Industry in Kerala 1950-1980", Economic and Political Weekly, July 31.
17. Joshi H. and Joshi V. 1976 "Surplus Labour and the City : A Study of Bombay", Asia Publishing House, Bombay.

18. Kalpagam U. 1981 "Labour in Small Industry : Case of Export Garments Industry in Madras", Economic and Political Weekly, November 28.
19. Kannan K.P. 1978 "Employment, Wages and Conditions of Work in Cashew Processing Industry", Working Paper No.78, Centre for Development Studies, Trivandrum.
20. Kannan K.P. 1981 "Evolution of Unionization and Changes in Labour Processes Under Lower Forms of Capitalist Production", Working Paper No.128, Centre for Development Studies, Trivandrum.
21. Kowaric L. 1976 "The Logic of Disorder : Capitalist Expansion in the Metropolitan Area of Greater São Paulo", Paper Included in the Seminar Volume 'Actes Du XLIIE Congress International Des Americanistes', Paris.
22. Kowaric L. (Undated) "The Price of Progress : Economic Growth, Impoverishment and Urban Spoilation", (Manuscript), CEDEC - São Paulo.
23. Leys C. 1973 "Interpreting African Underdevelopment", African Affairs Vol.72.
24. Lubell H. 1974 "Urban Development and Employment : Prospects for Calcutta", ILO, Geneva.
25. Mazumdar D. 1976 "Urban Informal Sector", World Development, August, Vol.4, No.8.
26. Middleton A. 1981 "Petty Manufacturing, Capitalist Enterprises and the Process of Accumulation in Ecuador", Development and Change, Vol.12.
27. Morley S.A. and Williamson J.G. 1977 "Class, Pay Differentials, Wage Strategy and Early Capitalist Development" in N. Nash (ed.) Essays on Economic Development and Cultural Change, Chicago University Press.
28. NPC (National Productivity Council) 1977 "Occupational Wage Disparities in Mines and Plantations", Mimeo, NFC, New Delhi.
29. Papola T.S. 1980 "Informal Sector : Concepts and Policy", Economic and Political Weekly, May 3.
30. Papola T.S. 1981 "Urban Informal Sector in a Developing Economy", Vikas Publishing House, New Delhi.
31. Papola T.S. and Mathur R.S. 1980 "Intersectoral Linkages in Manufacturing : A Study of Metal Engineering Industry in Kanpur", ILO, Geneva.
32. Patnaik P. 1978 "Industrialisation in India" Paper presented at an Indo-Dutch Workshop on Alternatives in Development, Mimeo, Indian Council of Social Science Research, New Delhi.
33. Prakash B. 1981 "Employment Among Slum Dwellers", Summary Report Prepared for the ILO, Mimeo, Tata Institute of Social Sciences, Bombay.

34. Roberts B. 1978 "Cities of Peasants", Edward Arnold, London.
35. Rodgers G. 1981 "Migration and Income Distribution", WEPR Working Paper No.108, ILO, Geneva.
36. Sandesara J.C. 1980 "Economies of Scale in Indian Industry", Mimeo, Indian Council of Social Science Research, New Delhi.
37. Santos M. 1979 "The Shared Space : Two Circuits of an Urban Economy and Their Spatial Repercussions", Methuen, London.
38. Seal K.C. "Women in Labour Force in India - A Macro-Statistical Profile", ARTEP, ILO, Bangkok.
39. Sethuraman S.V. 1976a "Jakarta : Urban Development and Employment", ILO, Geneva.
40. Sethuraman S.V. 1976b "The Urban Informal Sector : Concepts, Measurement and Policy", International Labour Review, July-August.
41. Singh V.B. et al 1976a "Survey of Urban Handicrafts in U.P. (Chikan)", Mimeo, Planning Commission of India, New Delhi.
42. Singh V.B. et al 1976b "Survey of Urban Handicrafts in U.P. (Carpets)", Mimeo, Planning Commission of India, New Delhi.
43. Sjoberg G. 1965 "Cities in Developing Industrial Societies" in P.N. Hauser and L.F. Schnore (eds.) "The Study of Urbanisation", Wiley, New York.
44. Souza P.R. and Tokman V.E. 1976 "The Informal Sector in Latin America", International Labour Review, January-February.
45. Standing G. 1977 "A Trichotomous Model of Urban Labour Markets" in S. Kanappan (ed.) "Urban Labour Market Behaviour in Developing Countries", International Institute of Labour Studies, Geneva.
46. Streefkerk H. 1981 "Too Little to Live On, Too Much to Die On - Employment in Small Scale Industries in Rural South Gujarat", Economic and Political Weekly, April 11, 18 and 25.
47. Subramanian K.K. et al 1979 "Construction Labour Market", Mimeo, Sardar Patel Institute of Economic and Social Research, Ahmedabad.
48. TISS (Tata Institute of Social Sciences) 1982 "Urban Poverty in the City of Bombay", On Going Study of the Indian Council of Social Science Research, New Delhi.
49. Watanabe S. 1978 "Technological Linkages Between Formal and Informal Manufacturing Industries", WEPR Working Paper No.34, ILO, Geneva.
50. Weeks J. 1975 "Policies for Expanding Employment in the Informal Sector in Developing Countries", International Labour Review, Jan.
51. World Bank 1975 "Housing : Sector Policy Paper", Washington.
52. World Bank 1981 "World Development Report", Washington.

FEMALE PARTICIPATION IN WORK - DEMOGRAPHIC,
DEVELOPMENTAL AND SOCIAL DIMENSIONS

Deepak Grover and Krishnappa

1.0. Introduction

Participation in work or non-participation in work of a population is influenced by several factors. Notable among them are demographic, developmental and social ones. In almost all societies neither the very young nor the elderly are expected to make an economically significant work contribution. While in the case of males demographic and economic factors are important in the case of females social factors also appear to play no less a role. Also there is the element of choice. An individual may or may not volunteer for work. The present paper focuses on female participation in work vis-a-vis males and how this participation is influenced by demographic, developmental and social dimensions.

A brief demographic profile of female population follows touching upon aspects that have a bearing upon work participation. In 1981, females constitute 48.3 per cent of India's population. For every thousand males there are 935 females. Only one-fourth of the female population is literate. For every 100 literate females there are 201 literate males. Marriage for females in India is almost universal. The average age at marriage for females in rural areas is 16.7 years and in urban areas 19.2 years (1971). On an average a woman bears 5.8 children in

The authors are grateful to Dr. P.M. Kulkarni for his comments and suggestions on the First draft of this paper.

rural areas and 4.3 children in urban areas during her reproduction span (1972). The expectation of life at birth for females is 51.6 years as compared to 52.6 years for males (1981)¹.

1.1. Data Comparability

Comparability of census data, over time, with respect to participation in work is a problem. This is because of changes in concepts and definitions, reference periods, structuring and ordering of questions etc. These changes render not only overtime comparability difficult but also influence different groups - rural/urban, male-female, organised/unorganised sectors, industrial/occupational categories, marginal/main workers etc. - differentially. Whether adjustments to render the data more comparable really result in better comparability is difficult to say. Similarly census population undercounts vary over states, age groups, by sex, by rural-urban residence etc. National Sample Survey (NSS) data is also not free from similar problems.²

To overcome these problems, at least partly, rather than compare overtime focus is on comparison and relative position of female workers vis-a-vis male workers at census time points. The data presented is from the Indian population census. However, at times to strengthen the argument and provide independent corroboratory evidence reference has been made to studies based on NSS data. In either case, Census or NSS data, and studies based on them, these limitations need to be kept in view.

1.2. Plan of the Paper

This introductory section is followed by section 'Two' where inter-state differentials in work participation for the period 1961-81 are discussed. This has been done separately for rural and urban residence. Some clues to the determinants of female participation in work have been provided. A brief discussion on unemployment is also there. Section 'Three' discusses female participation in work in relation to demographic developmental and social variables. Finally while summing up and concluding, policy implications are set forth.

2.0. Female Participation in Work : India and States

Relative position of female workers vis-a-vis male workers from 1901 to 1981, India, is presented in Table 1. A steady deterioration in the female position can be observed. Even if one were to reject the 1971 Census findings (as being the result of definitional, reference period etc., changes) one cannot escape the conclusion that the female position overtime has worsened.

This finding from Census data has also been corroborated from NSS data (27th and 32nd rounds, 1972-73 and 1977-78 respectively). In this period the absolute number of female workers in urban areas increased by 7 per cent. However, in rural areas they declined by 15 per cent. This is against the expected 12-13 per cent increases in population during the five year period.³

Tables 2A and 2B present work participation rates for males and females (for India and States) and the relative female-male position for rural and urban areas respectively for the period 1961-81. Broad points emerging from these tables are as follows:

1. Rural Work Participation rates are higher than urban, for India and States, for males as well as females.
2. Female position relative to males is better in rural areas than in urban areas as far as participation in work is concerned. Though in both rural and urban areas the female position is inferior to that of males.
3. There are unmistakable signs that overtime the female position has deteriorated more in rural than in urban areas.

Individual states may be exceptions to these broad conclusions. However, by and large the above stated conclusions are valid.

Tables 3A and 3B, provide information for India on the trends during 1961-81, in the industrial categories - cultivators, agricultural labourers, other workers and non-workers - by sex and rural/urban residence. Women are concentrated in the non-worker categories. In urban areas this concentration is more marked than in the rural areas. They appear to specialise in 'non-work'. In the remaining three categories (in rural as well as in urban areas) - cultivators, agricultural labourers and other workers - their concentration is far less than males and overtime there is a definite decline in this concentration.

In Table 4, percentage change over time (1961-81) is provided for population, workers, cultivators, agricultural labourers, other-workers and non-workers; by sex and rural-urban residence. Population growth rates for males and females in rural or urban areas are not very different. In rural areas while male workers increased by 30.5 per cent, the female workers declined by 24.3 per cent. In urban areas both male and female workers increased by 93.8 per cent and 49.7 per cent respectively. While male cultivators increased both in rural and urban areas, female cultivators declined. In the category 'other workers' whereas males increased both in rural and urban areas, females increased in urban areas but declined in rural areas. All 'non-worker' groups (rural males/urban males/rural females/urban females) grew in this period. However, while urban increases for males and females are more or less at par, in the rural areas female increase is considerably more than that for males.

Finally, with the help of Table 5, an attempt is made to arrive at certain clues towards the determinants of female participation in work. The conclusions arrived at are not very firm. Preferably, such an analysis should be done at the district level and also in greater detail and in depth.

There are six states with female work participation rates above 25. Namely - Andhra Pradesh, Maharashtra, Madhya Pradesh, Tamil Nadu, Karnataka and Gujarat. Except Tamil Nadu neither ranks high in rural (agricultural) development. Except Madhya Pradesh no state has a very high percentage of scheduled population (SC and ST). All have extensive millet (Jowar, Bajra) growing regions pointing to the existence of considerable agriculturally backward

areas within the states. Also they have rice growing agriculturally developed regions. In Maharashtra cotton is a major crop. Rice and cotton are labour intensive crops. While in the backward regions of these states survival being the problem - every one has to work. In the developed regions labour intensive crops are grown and in rice and cotton cultivation female labour is important. Additionally sex-ratio is relatively high indicating higher female social status and population density comparatively low indicating lower population pressure. A lower population pressure checks the tendency of male workers replacing female workers. The result is higher female participation in work.

Four States - Rajasthan, Orissa, Kerala and Bihar are in the intermediate female work participation range (14-20). These states are intermediate ranking ones in agricultural development. Rajasthan, Orissa and Bihar have considerable scheduled population. Sex-ratios are high as such female status is high. Bihar and Kerala have high population densities. Three states have rice as predominant crop. While rice cultivation, high scheduled population and relatively high sex-ratios tend to raise female participation in work higher densities tend to lower work participation.

Four States - Haryana, Uttar Pradesh, Punjab and West Bengal - have low female work participation rates. Agriculturally these are the developed states. Female status is low (low sex-ratios), population densities are high and three of them are wheat growing states. Wheat crop is less labour intensive and more amenable to mechanisation. Additionally three states constitute the 'jat' cultural belt. Female participation in work is low.

As stated earlier Table 5 is intended to provide clues to determinants of female participation in work. Some tentative ideas emerge. Development, low female social status, population pressure etc., tend to lower female participation in work. Backwardness (agricultural, higher scheduled population, millet regions etc.), lower population pressure and higher female social status lead to higher work rates for women. Further evidence on these aspects is provided in section 3.

2.1. Unemployment

Census data on unemployment provide an unrealistic picture of the unemployed in the country. This is due to the restrictive nature of related questions. In certain respects 1961 Census data on unemployment was better - though it also supplies very low rates of unemployment. The broad picture emerging is as follows. Both in rural and urban areas female unemployment rates are lower than males (one third or even still less). Urban rates are higher than rural. For scheduled populations (SC and ST) while rural rates are lower than that for general population, urban rates are higher.⁴

NSS 27th (1972-73) and 32nd (1977-78) rounds provide more realistic unemployment figures. Chronic unemployment among females is one-fifth of males in rural areas and one-third in urban areas (NSS 27th round). Urban rates are higher than rural. Female chronic unemployment increases sharply with level of education both in rural as well as in urban areas, more sharply in rural than in urban areas. Except for the educational category illiterate, both in rural and urban areas, in all other educational

categories female unemployment rates are substantially higher than males. While chronic unemployment is lower for females than males, current unemployment (Weekly status) and Person-days of unemployment per day rates among women are double of those for men.⁵

Comparing over time (NSS 27th and 32nd rounds) current unemployment (Weekly status) has slightly declined for females in rural areas. This is attributed to classificational changes over time. In urban areas the female position has worsened. General conclusion is that female unemployment has increased over the two NSS rounds and the position of women has substantially worsened in urban areas.⁶

2.2. Nature of Work Activity

80 per cent of female workers are engaged in primary sector - cultivation, horticulture, animal husbandry. They are mainly working either as helpers or as casual labourers in agriculture.

Only one out of six female workers engages in non-agricultural

activities. Only one in four works on a regular salary or is a regular wage earner. Most of them work in small scale industries and establishments in the unorganised sector. Their number in each industry/establishment is rather small compared to the total workers in each industry/establishment. Their nature of work is such that there is neither continuity of work or remuneration.

They enter or leave the work force more frequently than men, a process which is accentuated by their family and household responsibilities. This is an aspect which is likely to vitiate data on female participation in work.⁷

2.3. Wage Status

Women work mainly in the agricultural sector either as casual wage labour or as helpers (as family workers). Real wages in this sector have not improved much over time. While money wages have increased real wages have increased only slightly and even declined in several states. This being the overall situation. It is also well established that female wages are considerably below male wages (two-fifth to two-third of male wage).⁸ Similar evidence exists for other sectors of economy - women wages or salaries are less than male.

2.4. Social Status

To restate the obvious female social status in our society is low. Evidence on this flows from several channels. Part of this low social status stems from their low economic status - an aspect discussed in the previous pages of this section. There are several other indicators of this - their lower literacy and educational levels, their higher mortality levels (in particular infant and child mortality), and social elements like dowry. Their main vocations are household and family responsibilities - domestic chores, child bearing and rearing. Marriage is universal and many a women has discarded a working role to play the wife and mother (see section I).⁹

3.0. Female Participation in Work : The Determinants

At the outset it would be better to set aside the biological determinant. There is sufficient evidence on the score that female work participation, productivity, performance etc., are not

determined by the biological factor. If there are occupations that are influenced by the biological factor they are numerically small in number and inconsequential when it comes to influencing the course of economic participation in work of women in the society.¹⁰ Some of the remaining determinants are discussed under three broad rubrics - demographic, developmental and socio-cultural-educational.

3.1. Demographic

The single important determinant of labour force supply is growth of population. Population is a dynamic entity. It is continuously growing. Consequently labour force is also continuously growing. Even when population growth rate starts declining the labour force growth rate remains high for a period of twenty-five/thirty years. This is because of what in demographic terminology is referred to as 'Population Momentum'. Also those who are to enter the labour force in the coming 15-20 years are already borne. Other important demographic variables influencing work participation are age structure and urbanisation - equally important for both males and females. Additionally marriage is important in the case of females.¹¹

Given the labour supply, participation in work is subject to employment creation - the growth of latter has remained far behind the growth of population. This is reflected in the growing unemployment rates and increasing number of persons registered in employment exchange registers. In such a situation it is more likely that an available job would go to a male rather than to a female. In a social set-up like India's where males are the

favoured species, the processes of social discrimination, social selection etc., are likely to create a market employment situation unfavourable to females - consciously or sub-consciously. Already in section-II evidence has been presented of the deteriorating female work situation relative to males. Keeping in view that labour force growth rates will continue to remain high in the coming couple of decades and assuming that employment creation is unlikely to improve substantially and also taking into account the backlog in employment generation there is a fair chance that female work situation relative to males would deteriorate further.

3.2. Development

Economists and demographers have researched the relationship between female work participation (as also total work participation) and different developmental variables. When developmental progress is measured in terms of sectoral shifts (from primary to secondary and tertiary; from predominantly rural to predominantly urban, from overwhelmingly agricultural economy to non-agricultural economy, etc.) it has been observed that work participation rates which to begin with are high, first decline and then rise but do not attain the high levels which existed earlier.¹²

J.N. Sinha examined female participation in work for countries grouped by per capita income levels. He found that as per capita income level increased female participation in work first decreased and then rose. He introduced the concept that female participation in work and development has a U-shaped relationship.¹³ J.D. Durand also came to similar conclusions. However these cross-sectional findings are not supported by time series data.¹⁴

For the rural areas of India, Sinha found a negative association between female activity rates and male average income.¹⁵ Thus there is considerable evidence that development has at first a dampening effect on female work participation and then there is an upswing.

India is slowly becoming more and more urban. The secondary and tertiary sectors are expanding, agricultural sector is declining. Household industry is declining and agriculture is slowly being mechanised. In the rural areas in agriculture and household industry there are no rigid time norms of work. There exists a high level of compatibility amongst economic work, domestic chores and responsibilities of child bearing and rearing. However, if a woman is to shift from agriculture and household industry to urban work, industrial work, work in the organised sectors etc., than an element of incompatibility is introduced and the women has many times to make a choice between domesticity and work outside home and often opt for the former.

Agriculture is still the largest sector of Indian economy. It is developing and one element of development is mechanisation. Mechanisation appears to adversely influence activities traditionally performed by females.¹⁶

The process of development dampens work participation rates for both males and females. However, while males are not affected so much, females are more adversely affected. It also seems that males being economically and educationally the entrenched group are better able to defend and hedge their positions compared to the females.

3.3. Social, Cultural and Educational

In this section aspects like scheduled castes, scheduled tribes, religion, sanskritization, education etc., are discussed. The scheduled groups (SC and ST) are economically backward, highly illiterate, predominantly rural residing groups. Work participation rates of SC and ST females are higher than those for the non-scheduled female population. For these groups with low incomes it is a matter of survival. They cannot afford to be without work. Also they are not selective about the activities they perform.¹⁷

There is evidence that religion influences participation in work. Women in Muslim countries have very low work participation rates. This is due to the processes of 'seclusion' and 'exclusion' that are prevalent. Women are confined to the four walls of the house or move outside in 'Purdah'. Their participation in work, lowers the family status. As such their participation in work and particularly work outside home is not encouraged.¹⁸ Recent trends in these countries (the more vigorous following of Islamic tenets) could further lower economic activity rates. In India this cannot be easily examined because economic data classified by religion is unavailable.

In Bombay, Parsee women (an economically advanced, highly educated group) had higher work participation rates than the general population. However their rates were lower than those for SC and ST women.¹⁹

Coming to education two aspects are discussed. First, as more and more female children enrol for scholling the female child activity rates are going to decline. This would lower female economic participation. Secondly, what is the relation between labour force participation and educational attainment. In urban India literate women had lower participation rates than illiterate women. At the same time within the literate group higher educational attainment favoured increased labour force participation.²⁰

A person (male or female) not only wants a job but it should also be commensurate with family status, caste-class status, educational attainment and also the remuneration should be adequate. Unemployment rates are seen to increase with educational attainment.²¹ People look for an appropriate job and have the means to wait for it at least for sometime. For higher caste groups low status occupations such as scavenging, currying of hides etc., would be taboo. The same would apply to class groups though perhaps not so rigidly. M.N. Srinivas²² points to the fact that high status rural women stay out of work. Emulating them when the low status woman climbs up the ladder she also abstains from work. Perhaps work commensurate in status is not available in rural areas. It is a matter of family pride that women of the family do not have to go out for work. Also it is a matter of male pride and suits the male ego that his wife need not work.

Finally, in every society processes of social selection, social recruitment and social occupational rationing are in operation. The society regards a specific sex as more suitable for doing certain occupations (social occupational rationing). The systems of recruitment (employment exchanges etc.) have their own

biases in this context. The selection panels (interview boards etc.) have their own preferences. These processes usually operate against women. Often womanhood itself is held against women to deny them their legitimate due.²³

4.0 S

4.0. Summary and Policy Implications

Overtime the employment and unemployment situation for women has worsened. The nature of female activities is such that there is no continuity of employment. They work mainly in agriculture or in the unorganised sectors of the economy. Their family raising responsibilities force them quite frequently to quit and reenter the labour force. Their economic, educational and social status is low.

Developmental and social determinants of participation in work tend to keep their work participation rates low. Only in the case of special groups like SC and ST their participation in work is high. This is necessitated more for reasons of survival. In the face of rising unemployment, increasing numbers on employment exchange registers, increasing population and labour force size competing for created employment opportunities which are not rising in any spectacular manner the position of women is becoming more and more precarious. Vis-a-vis males the position of females has overtime definitely deteriorated.

Further future prospects are also bleak. Labour force growth rates for the coming two-three decades are going to remain high providing no relief from the supply side. On the demand side in the competition for scarce jobs the females are going to lose out to the males. Their educational attainments are going to improve -

but their skills and talents are more likely to remain unutilised. More seriously there are prospects of continuing low or even declining economic and social status.

Keeping in view this assessment, could the developmental plans be reshaped to promote those sub-sectors of the economy which employ female labour predominantly. Also could efforts be made to prevent further decline of those sub-sectors (traditional or otherwise) wherein there is scope for female employment and could these be reorganised, modernised, and expanded without a deleterious impact on female employment. Finally, a policy on female employment which ensures work availability, work continuity and better remuneration is needed.

Table 1 : Census Work Participation Rate Trends,
India : 1901-1981

| Year | Work Participation Rates | | |
|---|--------------------------|--------|-------------|
| | Male | Female | Female/Male |
| 1901 | 61.11 | 31.70 | 0.52 |
| 1911 | 61.90 | 33.73 | 0.54 |
| 1921 | 60.52 | 32.67 | 0.54 |
| 1931 | 58.27 | 27.63 | 0.47 |
| 1941* | - | - | - |
| 1951 | 54.05 | 23.30 | 0.43 |
| 1961 | 57.10 | 27.96 | 0.49 |
| 1971 | 52.55 | 12.73 | 0.24 |
| 1981 | 53.20 | 20.80 | 0.39 |
| Maximum Percentage Decline (1911-71) | 15.11 | 62.26 | 55.60 |

Sources : (1) J.N. Sinha, 1982, '1981 Census Economic Data : A Note', Economic and Political Weekly, XVII, 6, p.197.

(2) K.C. Seal, 'Review of Current Statistics on Employment and Unemployment in India', in National Colloquium on Employment Strategy and Investment Pattern Under Sixth Five Year Plan, March 1981, sponsored by Shri Ram College of Commerce, University of Delhi, New Delhi, p.2.

* Data not compiled because of World War II.

Table 2A: Participation in Work by Sex and Rural Residence, India and States : 1961-81

| | Work Participation Rates : RURAL | | | | | | | | |
|------------------|----------------------------------|------|------|--------|------|------|-------------|------|------|
| | Male | | | Female | | | Female/Male | | |
| | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 |
| INDIA | 58.2 | 53.5 | 54.3 | 31.4 | 15.8 | 23.9 | 0.54 | 0.29 | 0.44 |
| Andhra Pradesh | 64.3 | 60.2 | 63.2 | 46.0 | 31.9 | 44.9 | 0.72 | 0.53 | 0.71 |
| Assam | 54.0 | 48.7 | - | 32.4 | 5.6 | - | 0.60 | 0.11 | - |
| Bihar | 56.0 | 52.7 | 51.0 | 28.5 | 10.3 | 14.5 | 0.51 | 0.19 | 0.28 |
| Gujarat | 53.3 | 52.8 | 54.7 | 34.1 | 15.1 | 26.2 | 0.62 | 0.29 | 0.48 |
| Haryana | 53.0 | 47.5 | 50.3 | 24.7 | 2.3 | 14.5 | 0.47 | 0.05 | 0.29 |
| Himachal Pradesh | - | 52.3 | 51.6 | - | 21.7 | 32.3 | - | 0.41 | 0.63 |
| Jammu & Kashmir | 59.3 | 53.7 | - | 29.5 | 4.2 | - | 0.50 | 0.08 | - |
| Karnataka | 60.4 | 56.4 | 57.1 | 36.8 | 19.0 | 30.8 | 0.61 | 0.34 | 0.54 |
| Kerala | 47.4 | 45.3 | 45.7 | 20.9 | 15.3 | 18.2 | 0.44 | 0.34 | 0.40 |
| Madhya Pradesh | 61.6 | 55.3 | 56.3 | 48.6 | 25.8 | 35.5 | 0.79 | 0.47 | 0.64 |
| Maharashtra | 58.1 | 52.6 | 55.6 | 46.7 | 28.9 | 40.8 | 0.80 | 0.55 | 0.73 |
| Manipur | - | 46.4 | 51.8 | - | 24.9 | 46.0 | - | 0.54 | 0.89 |
| Meghalaya | - | 54.0 | 55.4 | - | 38.0 | 41.4 | - | 0.70 | 0.75 |
| Nagaland | - | 53.5 | 58.1 | - | 47.9 | 52.8 | - | 0.90 | 0.91 |
| Orissa | 61.0 | 55.8 | 57.0 | 27.4 | 10.8 | 20.9 | 0.45 | 0.19 | 0.37 |
| Punjab | 53.4 | 53.7 | 52.5 | 5.9 | 0.7 | 9.7 | 0.11 | 0.01 | 0.18 |
| Rajasthan | 60.1 | 53.6 | 52.1 | 40.8 | 36.0 | 25.0 | 0.68 | 0.67 | 0.48 |
| Tamil Nadu | 62.2 | 58.6 | 59.8 | 37.1 | 20.4 | 34.5 | 0.60 | 0.35 | 0.58 |
| Tripura | - | 50.3 | 51.3 | - | 4.8 | 13.3 | - | 0.10 | 0.26 |
| Uttar Pradesh | 59.2 | 53.0 | 52.2 | 19.9 | 7.3 | 10.6 | 0.34 | 0.14 | 0.20 |
| West Bengal | 53.5 | 48.5 | 51.4 | 10.6 | 4.6 | 9.4 | 0.20 | 0.09 | 0.18 |

Table 2B : Participation in Work by Sex and Urban Residence, India and States : 1961-81

| India/ States | Work Participation Rates : URBAN | | | | | | | | |
|---------------------|----------------------------------|------|------|--------|------|------|-------------|------|------|
| | Male | | | Female | | | Female/Male | | |
| | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 |
| INDIA | 52.4 | 48.8 | 49.7 | 11.2 | 7.2 | 10.6 | 0.21 | 0.51 | 0.21 |
| Andhra Pradesh | 52.4 | 49.9 | 52.8 | 18.7 | 11.7 | 18.1 | 0.36 | 0.23 | 0.34 |
| Assam | 55.4 | 50.2 | - | 9.9 | 4.4 | - | 0.18 | 0.08 | - |
| Bihar | 51.7 | 47.5 | 44.1 | 10.4 | 4.5 | 4.9 | 0.20 | 0.09 | 0.11 |
| Gujarat | 49.4 | 47.3 | 50.4 | 9.2 | 6.1 | 23.2 | 0.19 | 0.13 | 0.46 |
| Haryana | 48.5 | 46.2 | 53.8 | 5.7 | 3.2 | 10.3 | 0.12 | 0.06 | 0.19 |
| Himachal Pradesh | - | 54.5 | 54.0 | - | 7.1 | 11.1 | - | 0.13 | 0.21 |
| Jammu & Kashmir | 50.8 | 47.1 | - | 5.8 | 2.5 | - | 0.11 | 0.05 | - |
| Karnataka | 51.6 | 48.3 | 48.3 | 14.9 | 9.8 | 11.8 | 0.29 | 0.20 | 0.24 |
| Kerala | 46.0 | 43.5 | 43.4 | 13.0 | 11.2 | 11.8 | 0.28 | 0.26 | 0.27 |
| Madhya Pradesh | 52.4 | 46.2 | 47.2 | 14.5 | 8.0 | 9.6 | 0.28 | 0.17 | 0.20 |
| Maharashtra | 54.8 | 51.1 | 51.0 | 13.4 | 8.9 | 10.4 | 0.24 | 0.17 | 0.20 |
| Manipur | - | 38.0 | 45.3 | - | 14.9 | 30.3 | - | 0.39 | 0.67 |
| Meghalaya | - | 48.5 | 47.7 | - | 13.4 | 16.2 | - | 0.28 | 0.34 |
| Nagaland | - | 69.9 | 57.6 | - | 9.1 | 29.4 | - | 0.13 | 0.51 |
| Orissa | 57.2 | 50.6 | 50.1 | 13.1 | 7.6 | 9.5 | 0.23 | 0.15 | 0.19 |
| Punjab | 50.9 | 49.9 | 52.9 | 4.7 | 2.7 | 7.6 | 0.09 | 0.05 | 0.14 |
| Rajasthan | 49.0 | 45.1 | 45.9 | 10.1 | 4.9 | 6.1 | 0.21 | 0.11 | 0.13 |
| Tamil Nadu | 55.2 | 50.3 | 52.8 | 14.9 | 9.7 | 12.8 | 0.27 | 0.19 | 0.24 |
| Tripura | - | 41.8 | 45.4 | - | 5.4 | 8.7 | - | 0.13 | 0.19 |
| Uttar Pradesh | 51.7 | 47.9 | 48.3 | 5.3 | 3.1 | 4.7 | 0.10 | 0.06 | 0.10 |
| West Bengal | 55.4 | 49.8 | 50.4 | 5.1 | 3.9 | 7.3 | 0.09 | 0.08 | 0.14 |

Table 3A : Rural Workers Industrial Classification Trends, India : 1961-81

| Industrial Category | Male | | | Female | | | Female/Male | | |
|---------------------|------|------|------|--------|------|------|-------------|------|------|
| | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 |
| I | 35.6 | 29.9 | 29.5 | 18.5 | 4.3 | 6.6 | 0.52 | 0.14 | 0.22 |
| II | 9.2 | 13.5 | 13.0 | 7.8 | 7.1 | 8.8 | 0.84 | 0.52 | 0.68 |
| Other Workers | 13.4 | 10.1 | 10.8 | 5.1 | 1.7 | 2.4 | 0.38 | 0.17 | 0.22 |
| Non-Workers | 41.8 | 46.5 | 46.7 | 68.6 | 86.9 | 82.2 | 1.64 | 1.87 | 1.76 |

Table 3B : Urban Workers Industrial Classification Trends, India : 1961-1981

| Industrial Category | Male | | | Female | | | Female/Male | | |
|---------------------|------|------|------|--------|------|------|-------------|------|------|
| | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 | 1961 | 1971 | 1981 |
| I | 2.9 | 2.5 | 2.5 | 1.3 | 0.3 | 0.4 | 0.45 | 0.12 | 0.16 |
| II | 1.2 | 2.3 | 2.3 | 1.2 | 1.2 | 1.2 | 1.00 | 0.52 | 0.52 |
| Other Workers | 48.3 | 44.0 | 44.0 | 8.6 | 5.1 | 6.1 | 0.18 | 0.12 | 0.13 |
| Non-Workers | 47.6 | 51.2 | 51.2 | 88.9 | 93.4 | 92.3 | 1.86 | 1.82 | 1.80 |

Table 4 : Percentage Change in Total Population and Population in Selected Work Categories by Sex and Residence : 1961-1981

| Population/ Industrial Category | Percentage Change : 1961-81 | | | |
|---------------------------------------|-----------------------------|--------|-------|--------|
| | Rural | | Urban | |
| | Male | Female | Male | Female |
| Population | 45.5 | 44.2 | 106.3 | 111.2 |
| Workers | 30.5 | -24.3 | 93.8 | 49.7 |
| Cultivators | 18.1 | -52.6 | 75.4 | -39.3 |
| Agricultural Labourers | 100.8 | 51.2 | 298.1 | 121.5 |
| Other Workers | 15.5 | -37.0 | 89.8 | 54.0 |
| Non-Workers | 66.5 | 75.5 | 119.5 | 118.5 |

Note : For 1981, marginal workers have been added to the non-worker categories. (Three workers constitute 2.1 per cent of the male workers and 7.4 per cent of female workers). This lowers the total number of workers and also workers in industrial categories more in the case of females than for males. This would alter the percentage change over 1961-81 slightly. However, it would not weaken the main theme of the paper.

Table 5 : Female Work Participation Rates and Selected Indicators : Fourteen Major States

| States | Female ¹ Work Partici- pation Rates 1981 | Rural ² (Agri- cultural) Develop- ment Ranks | Percent Schedu- led Po- pulation (SC+ST) 1971 | Sex Ratio 1981 | Popula- tion Density (Per SquareKm) 1981 | Predominant Crop |
|-------------------|--|--|--|----------------------|---|-----------------------|
| Andhra Pradesh | 38.8 | 7 | 17.1 | 975 | 194 | Rice/Millets |
| Maharashtra | 30.7 | 9.5 | 11.9 | 939 | 204 | Millets/Cotton |
| Madhya Pradesh | 30.4 | 13 | 33.2 | 941 | 118 | Rice/Millets |
| Tamil Nadu | 27.4 | 3 | 18.6 | 978 | 371 | Rice/Millets |
| Karnataka | 25.4 | 8 | 13.9 | 963 | 193 | Rice/Millets |
| Gujarat | 25.4 | 12 | 20.8 | 942 | 173 | Millets/ Groundnut |
| Rajasthan | 20.8 | 5 | 27.9 | 921 | 100 | Millets/Wheat |
| Orissa | 19.7 | 11 | 38.2 | 982 | 169 | Rice/Pulses |
| Kerala | 17.0 | 9.5 | 9.6 | 1034 | 654 | Rice/ Plantation |
| Bihar | 14.0 | 14 | 22.9 | 947 | 402 | Rice/Wheat |
| Haryana | 13.6 | 2 | 18.9 | 877 | 291 | Wheat/ Bengal Gram |
| Uttar Pradesh | 9.6 | 5 | 21.2 | 886 | 377 | Wheat/Rice |
| Punjab | 9.2 | 1 | 24.7 | 886 | 331 | Wheat/Rice |
| West Bengal | 8.9 | 5 | 25.6 | 911 | 614 | Rice/Pulses |

¹ Arranged in declining order

² Rural (Agricultural) development ranking takes into account the following:

- a. Percent Agricultural workers to total workers, 1971.
- b. Average Food Grain Production Per Capita, 1978-79/80-81.
- c. Percent Gross Irrigated Area to Gross cropped Area 1978-79.

- Sources: 1. Same as for Tables 2-4.
2. Government of Maharashtra, Directorate of Economics and Statistics, Economic Survey of Maharashtra 1981-82, Bombay, 1982, pp.X-XIII.
3. Government of India, Ministry of Agriculture and Irrigation, Report of the National Commission on Agriculture 1976: Part IV, New Delhi, 1976, p.156.

REFERENCES

¹a) Cansus of India, 1981, Series-1, India, Provisional Population Totals, New Delhi.

b) Government of India, Ministry of Health and Family Welfare, Year Book 1978-79, New Delhi.

²a) K.C. Seal, 'Review of Current Statistics on Employment and Unemployment in India' in National Colloquiemon Employment Strategy and Investment Pattern under Sixth Five Year Plan, sponsored by Shri Ram College of Commerce, University of Delhi, March 1981, New Delhi, pp.1-14.

b) J.N. Sinha, 1982, '1981 Census Economic Data : A Note', EPW, XVII, 6, pp.195-203.

³K.C. Seal, 1981, op.cit., p.11.

⁴F.H. Rayappa and Deepak Grover, 1980, Employment Planning for the Rural Poor : The Case of Scheduled Castes and Scheduled Tribes, Sterling, New Delhi, p.79.

⁵K.C. Seal, 1981, op. cit., pp.9-10.

⁶Ibid., p.14.

⁷a) Pravin Visaria and Anrudh K. Jain, 1976, Country Profiles: India, The Population Council, New York, p.18.

b) K.C. Seal, 1981, op.cit., p.9.

⁸Kalpana Bardhan, 1977, 'Rural Employment, Wages and Labour Market in India : A Survey of Research', EPW, XII, Part I, EPW XII, 26, A 34-48; Part II, EPW XII, 27, pp.1062-74; Part III, EPW XII, 28, pp.1101- -

⁹P H Rayappa and Deepak Grover, 'Modernisation and Female Work Participation', Population Research Centre, Institute for Social and Economic Change, Bangalore, (Typed).

¹¹a) P Robert Bierstadt, 1970, Social Order, Tata MacGraw Hill, New Delhi, pp.357-83.

b) M C Ferber and J W Loeb, 1977, 'Performance, Records and Perceptions of Sex Discrimination Among Male and Female Faculty', in Joan Huber (ed), Changing Women in a Changing Society, Chicago, University of Chicago Press, pp.233-40.

c) Joan Huber (ed), 1977, Changing Women in a Changing Society, Chicago, Chicago University Press, p.2.

¹¹a) J N Sinha, 1981, 'Population and Employment in Asian Economies', Paper presented at the IIPS Silver Jubilee Celebration Seminar, Bombay.

b) Jaipal P Ambannavar, 1975, Population, Macmillan, Delhi, pp.77-80.

¹²a) J L Sadie, 1965, 'Demographic Aspects of Labour Supply and Employment' Moderator's Report, Proceedings of the World Population Conference, Belgrade, 1965, Vol.I, p.223.

b) E Denti, 1968, "Sex-age Patterns of Labour Force Participation by Urban and Rural Populations", International Labour Review, 98, 6, pp.525-50.

c) John D Durand, 1975, The Labour Force in Economic Development : A Comparison of International Census Data 1946-66, Princeton University Press, Princeton, p.108, 120.

d) Ester Boserup, 1973, "Employment of Women in Developing Countries", International Population Conference, IUSCP, Leige, Vol.I, pp.381-90.

¹³J N Sinha, 1965, "Dynamics of Female Participation in Economic Activity", Proceedings of the World Population Conference 'Belgrade, 1965) and reprinted in : Office of the Registrar General, Papers Contributed by Indian Authors to the World Population Conference, New Delhi pp.336-337.

¹⁴J D Durand, 1975, op. cit., pp.125-127, 150.

¹⁵J N Sinha, 1965, op. cit., pp.336-337.

¹⁶M H Billings and Arjan Singh, 'Mechanisation and Rural Employment : EFW, V, 26, June 27, 1970, pp.A61-72.

¹⁷P H Rayappa and Deepak Grover, 1980, op.cit.

¹⁸Nadia Yousseff, 1971, "Social Structure and the Female Labour Force : The Case of Women Workers in Muslim Middle Eastern Countries", Demography, 8, 4, pp.427-39.

¹⁹Rayappa and Grover, 'Modernisation and Female Work Participation', op.cit.

²⁰J N Sinha, 1965, op.cit.

²¹K C Seal, 1981, op.cit.

²²M N Srinivas, 1977, 'The Changing Position of Indian Women', Man, 12, 2, pp.221-238.

- ²³a) Robert Bierstadt, 1970, op.cit.
b) Ferber and Loeb, 1977, op.cit.
c) Joan Huber, 1977, op.cit.

Sources of Data (Tables 2-5)

¹Ashok Mitra, Registrar General and Census Commissioner,
Census of India, 1961, Series-I, India, Part II-A (ii), Union
Primary Census Abstract, 1963, Delhi.

²A Chandrasekhar, Registrar General and Census Commissioner,
Census of India, 1971, Series-I, India, Part II-A (ii), Union
Primary Census Abstract, 1974, Delhi.

³P Padmanabha, Registrar General and Census Commissioner,
Census of India, 1981, Series-I, India, Paper-3 of 1981,
Provisional Population Totals : Workers and Non-Workers, Nasik,
1982.

TRENDS IN INTER-STATE VARIATIONS IN EMPLOYMENT PATTERN

Dr. R.S.Mathur
Department of Economics
Lucknow University
LUCKNOW

INTRODUCTION

This paper makes a study of census data on male workers with a view to examining the trends in inter-state variations in employment pattern from 1951 to 1981 and providing an explanation thereof. The focus on male workers has been dictated by the fact that the census statistics on female workers shows a high degree of volatility of which a large part is to be accounted for /changes in the concept of "work". Male participation in work being of a more stable character, the changes in the concepts of "work" may be expected to have affected comparability only inconsequentially. Despite this limitation, a study of male workers, as it relates to an overwhelming proportion of total workers (70 percent to 80 percent in different censuses), should reveal the overall direction of change in the employment pattern that has occurred in India since the inception of planning.

Employment pattern has been studied in terms of two broad activity sectors : agricultural (with cultivators and agricultural labourers as two distinct categories) and non-agricultural. Although a more detailed classification scheme for studying changes in employment pattern has obvious advantages in highlighting the tendencies towards diversification in employment together with trends in

in regard to disparity, we have kept ourselves confined to the broad sectors because (i) the detailed classification of workers in 1981 is not yet available and (ii) we find from the census statistics for 1951, 1961 and 1971 that a higher proportion of workers in non-agricultural sector is associated with a more diversified employment pattern. Given (ii) above, sacrificing the use of a more detailed classification scheme for delineating employment pattern in favour of broad agricultural and non-agricultural sectors helps us to concentrate on trends in inter-state disparity in respect of employment pattern.

Inter-state trends are studied with respect to the States for which comparable statistics for all census years from 1951 to 1981 are available. This has meant exclusion of the States formed later alongwith Assam for which 1981 census statistics is not available and bracketing of Gujarat with Maharashtra and Punjab with Haryana.

TABLE 1

PERCENTAGE DISTRIBUTION OF MALE WORKERS BY BROAD ACTIVITIES IN CENSUSES

| States | Census | <u>Agriculture</u> | | <u>Non-Agricultural</u> |
|---------------|--------|--------------------|---------------------|-------------------------|
| | | Cultivators | Agricultural labour | |
| 1. | 2. | 3. | 4. | 5. |
| Uttar Pradesh | 1951 | 41.27 | 24.03 | 34.70 |
| | 1961 | 41.19 | 21.72 | 37.09 |
| | 1971 | 37.35 | 27.73 | 34.92 |
| | 1981 | 36.68 | 26.61 | 36.71 |
| Assam | 1951 | 64.20 | 3.09 | 32.71 |
| | 1961 | 63.97 | 4.62 | 31.41 |
| | 1971 | 59.66 | 9.99 | 30.35 |
| Bihar | 1951 | 60.37 | 22.39 | 17.24 |
| | 1961 | 53.46 | 19.87 | 26.67 |
| | 1971 | 47.56 | 33.29 | 19.15 |
| | 1981 | 46.96 | 30.65 | 22.39 |

contd....

Table 1

Percentage Distribution of Male Workers by Broad Activities in Censuses (Contd.)

| States | Census | Agriculture | | Non-Agricultural labour |
|--------------------------|--------|-------------|---------------------|----------------------------|
| | | Cultivators | Agricultural labour | |
| 1. | 2. | 3. | 4. | 5. |
| Gujarat + Maharashtra | 1951 | 41.03 | 17.85 | 41.12 |
| | 1961 | 43.59 | 16.09 | 40.32 |
| | 1971 | 39.14 | 20.19 | 40.67 |
| | 1981 | 35.59 | 18.22 | 46.19 |
| Kerala | 1951 | 25.62 | 22.75 | 51.63 |
| | 1961 | 22.92 | 13.09 | 63.99 |
| | 1971 | 21.81 | 25.10 | 53.09 |
| | 1981 | 15.81 | 23.38 | 60.81 |
| Madhya Pradesh | 1951 | 54.01 | 21.77 | 24.22 |
| | 1961 | 59.44 | 14.00 | 25.56 |
| | 1971 | 56.70 | 19.33 | 23.97 |
| | 1981 | 54.00 | 17.72 | 28.28 |
| Madras | 1951 | 40.98 | 17.72 | 28.28 |
| | 1961 | 41.87 | 15.30 | 43.83 |
| | 1971 | 34.51 | 24.15 | 41.34 |
| | 1981 | 31.98 | 23.16 | 44.56 |
| Mysore | 1951 | 52.21 | 14.53 | 33.25 |
| | 1961 | 53.36 | 12.60 | 34.04 |
| | 1971 | 44.16 | 21.12 | 34.72 |
| | 1981 | 43.06 | 18.93 | 38.01 |
| Orissa | 1951 | 57.92 | 16.17 | 25.91 |
| | 1961 | 59.78 | 15.11 | 25.12 |
| | 1971 | 52.71 | 25.33 | 21.96 |
| | 1981 | 52.70 | 23.17 | 24.13 |
| Punjab | 1951 | 54.48 | 9.79 | 35.73 |
| | 1961 | 51.86 | 8.38 | 39.76 |
| | 1971 | 45.80 | 18.49 | 35.71 |
| | 1981 | 40.57 | 19.81 | 39.62 |
| Rajasthan | 1951 | 64.56 | 4.94 | 30.50 |
| | 1961 | 68.47 | 3.75 | 27.78 |
| | 1971 | 65.07 | 7.63 | 27.30 |
| | 1981 | 61.40 | 5.92 | 32.68 |
| Uttar Pradesh | 1951 | 66.56 | 6.47 | 26.67 |
| | 1961 | 63.62 | 9.05 | 27.32 |
| | 1971 | 59.10 | 17.18 | 23.72 |
| | 1981 | 59.26 | 14.42 | 26.32 |
| West Bengal | 1951 | 36.32 | 14.71 | 48.96 |
| | 1961 | 38.76 | 14.41 | 46.83 |
| | 1971 | 33.58 | 25.00 | 41.42 |
| | 1981 | 32.39 | 23.32 | 44.29 |
| ALL INDIA | 1951 | 51.90 | 14.95 | 33.15 |
| | 1961 | 51.47 | 13.42 | 35.11 |
| | 1971 | 46.23 | 21.26 | 32.51 |
| | 1981 | 43.77 | 19.77 | 36.46 |

I

Statistics

Table 1 gives a percentage break-up of workers into agricultural (cultivators and agricultural labourers) and non-agricultural sectors. It shows that (i) most of the States with the exception of Orissa, Uttar Pradesh and West Bengal have experienced an increase in the proportion of workers engaged in non-agricultural sector and (ii) within the agricultural sector, there has been a decrease in the proportion of workers engaged as cultivators and an increase in that of agricultural labourers in all the States except Madhya Pradesh where the proportion of cultivators, with inter-censal fluctuations, remained stationary.

Dispossession from land as cultivators provides a source of supply of wage labour in or out of the agricultural sector, in addition to the natural growth of numbers among agricultural labourers and non-agricultural labourers. The growth of employment in non-agricultural sector relatively to that in agriculture as agricultural labour would depend upon the relative strength of demand for labour from the two sectors, (iii) the increase in the proportion of non-agricultural workers, irrespective of the initial proportion of employment, has been of 4 percent to 5 percent for most of the States, with Andhra Pradesh, Rajasthan and Kerala as exceptions. This has resulted in narrowing the inter-state variation in the proportions engaged in different

categories. Table II which gives the values of coefficients of variation confirms this fact.

TABLE II
VALUES OF COEFFICIENTS OF VARIATION

| Census | Cultivators | Agricultural Labour | Non-Agricultural Workers |
|--------|-------------|---------------------|--------------------------|
| 1951 | 23.952 | 45.088 | 48.386 |
| 1961 | 29.657 | 39.490 | 29.248 |
| 1971 | 26.184 | 31.685 | 28.393 |
| 1981 | 29.625 | 30.649 | 28.776 |

II

Explanatory Model

We have to explain the rise in the proportion of non-agricultural workers and reductions in inter-state variations. We have made an attempt to do so with the help of a simplified model which makes use of supply-demand framework, controlling for the influence of population on the employment pattern. Variables included under supply and demand are those which have a basis in the received theory on structural transformation of the economy. Specifically, the model consists of following variables :

- X_1 = Percentage proportion of male workers in non-agricultural sector;
- X_2 = Density of population per Square Kilometre
- X_3 = Per Capita Income
- X_4 = Per Acre / Hectare Agricultural Productivity.

The rationale underlying the model is that the influence of population on the pattern of employment being of a type which is not likely to change, the share of workers in the non-agricultural sector can rise if improvements in agricultural productivity help release the supply of labour which would be absorbed in non-agricultural employment if demand rises. The demand and the extent of its diversification depends upon per capita income.

The inter-State disparities would widen or shrink if the relationship between the dependent variable and independent variables gets altered or modified due to some fresh development. With a view to examining this issue, the same explanatory model has been used to explain the inter-state variations in the proportion of male workers in non-agricultural sector in 1951 and in 1981. The influence of each of the explanatory variables has been examined by successively controlling the influence of remaining two variables, using partial correlation analysis. Significance of the finding has been tested with the help of 't' test, the values of which are given in parentheses below the 2nd order partial coefficients.

: 7 :

III

Results and Conclusion

Correlation matrix for 1951 and for 1981 are given below.

| | 1951 | | | | 1981 | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | X_1 | X_2 | X_3 | X_4 | | X_1 | X_2 | X_3 | X_4 |
| X_1 | 1.000 | 0.538 | 0.686 | 0.667 | X_1 | 1.000 | 0.538 | 0.524 | 0.676 |
| X_2 | 0.538 | 1.000 | 0.262 | 0.930 | X_2 | 0.538 | 1.000 | 0.088 | 0.910 |
| X_3 | 0.686 | 0.262 | 1.000 | 0.294 | X_3 | 0.524 | 0.088 | 1.000 | 0.155 |
| X_4 | 0.667 | 0.930 | 0.294 | 1.000 | X_4 | 0.676 | 0.910 | 0.155 | 1.000 |

The results of partial correlation analysis are given below.

| | <u>1981</u> | <u>1951</u> |
|---------------|--------------------|--------------------|
| r_{12} | 0.538 | 0.538 |
| $r_{12.3}$ | 0.580 | 0.510 |
| $r_{12.34}$ | -0.220 (-.4079) | -0.385 (-.7505) |
| r_{13} | 0.524 | 0.686 |
| $r_{13.2}$ | 0.567 | 0.670 |
| $r_{13.24}$ | 0.566 (3.7699) | 0.711 (8.1786)* |
| r_{14} | 0.676 | 0.667 |
| $r_{14.2}$ | 0.534 | 0.539 |
| $r_{14.23}$ | 0.533 (3.1668)* | 0.603 (4.5723)* |
| $R^2_{1.234}$ | 0.655 | 0.751 |

* computed 't' values exceed the tabulated values at 1 percent level.

Following conclusions follow :

- (1) The model has a high explanatory power and shows a more or less stable pattern of relationships.
- (2) The influence of population on the level of non-agricultural employment, controlling for the influence of per capita income and agricultural productivity is insignificant and remains more or less the same over time.
- (3) The influence of both per capita income and agricultural productivity on the dependent variable is weaker in 1981 than it was in 1951. It appears that the sources of improvements in agricultural productivity have changed in such a manner as to release less labour. Labour absorptive capacity of new farm technology is rated to be high. On the other hand, increased per capita income does not seem to be getting translated into as much demand for labour as before due to increased capital intensity. If true, such changes working behind supply and demand variables would explain reduced inter-state disparity in the proportion of male workers in the non-agricultural sector.

4. Our model yields conclusions which are suggestive. It needs to be made more comprehensive by taking into account technological dimension of production both in the agricultural and non-agricultural sectors.

...

APPENDIX TABLE

| States | Variables | | | | | | | |
|-----------------------|----------------|-------|----------------|------|----------------|-------|----------------|------|
| | X ₁ | | X ₂ | | X ₃ | | X ₄ | |
| | 1981 | 1951 | 1981 | 1951 | 1981 | 1951 | 1981 | 1951 |
| Andhra Pradesh | 36.71 | 34.70 | 194 | 113 | 1148 | 257.5 | 1560 | 140 |
| Bihar | 22.39 | 17.24 | 402 | 223 | 795 | 180.6 | 1857 | 183 |
| Gujarat + Maharashtra | 46.19 | 41.12 | 189 | 94 | 1840 | 377.2 | 1242 | 93 |
| Kerala | 60.81 | 51.63 | 654 | 349 | 1141 | 303.9 | 4043 | 494 |
| Madhya Pradesh | 28.28 | 24.22 | 118 | 59 | 877 | 235.8 | 932 | 84 |
| Madras | 44.86 | 41.30 | 371 | 232 | 1274 | 244.7 | 1807 | 239 |
| Mysore | 38.01 | 33.25 | 193 | 101 | 1246 | 286.8 | 1443 | 118 |
| Orissa | 24.13 | 25.91 | 169 | 94 | 843 | 251.8 | 1571 | 165 |
| Punjab | 39.62 | 35.73 | 311 | 155 | 2073 | 404.4 | 2120 | 159 |
| Rajasthan | 32.68 | 30.50 | 100 | 47 | 1011 | 256.3 | 698 | 63 |
| Uttar Pradesh | 26.32 | 26.67 | 377 | 215 | 994 | 270.5 | 1488 | 190 |
| West Bengal | 144.29 | 43.96 | 614 | 296 | 1390 | 471.4 | 2873 | 347 |

Agricultural Productivity for 1951 is per acre
while for 1981 it is per hectare.

Regional Aspect of Agricultural Dynamics in India

Pradhan H. Prasad

It has been found that increase in agricultural production has shown a distinct improvement in the post-independence era. It has also been observed that the growth in agricultural production remains higher after mid-sixties. In case of growth, in pre-mid-sixties, expansion of area remains more important factor, while the productivity plays a much more important role in the context of agricultural production after 1966-67 (table-1). This increase in production and spurt in productivity after mid-sixties is usually understood as agricultural development. Regional disparities that surfaced herein was taken to imply unevenness in the process of capitalist development of agriculture in the post independence India.

Increase in production may be due to increase in area under cultivation or productivity increase or may be both. If it is due to increase in area, it implies generally traditional approach to agricultural activity which brings about change in production but not in 'relations of production'. Even if this increase is due to irrigation expansion (also associated with increase intensity of cropping), it may not be different than the traditional approach, unless irrigation expansion itself is non-traditional like widespread use of power, for lift irrigation or canal irrigation in areas where there was either no irrigation and or non-canal surface irrigation and or lift irrigation using traditional technology. The technology which marks a break from traditional technology (that is, which marks a change in 'forces of Production') offers the basis for increase in the level of consciousness of those

engaged in agricultural activities and thus, dynamises the process of change in the 'relations of production'. Irrigation expansion may then become an attribute of development. Similar is the case with productivity increase. The increase in productivity, if obtained, by say change in cropping pattern and or traditional irrigation and/or increased use of traditional tools and implements, manure and good quality of seeds, cannot be associated with development. The increased surplus that came in the hands of agriculturists after independence led to increase agricultural production and productivity mostly on traditional lines. This hardly brought about a change in 'relations of Production'. Even the abolition of a class of intermediaries which was completed all over India by early sixties did not by itself bring about much change in agrarian structure except it gave a little more security to top and middle level agriculturists. This brought about increase in production and productivity mostly on traditional lines but did not bring a change in 'relations of production' in most part of the rural India. The use of fertiliser is a step forward in the direction of technological improvement and the use of fertilisers, pesticides and High Yielding Variety of seeds (known as the New Technology and which came specially after mid-sixties) is a breakthrough so far technology in agricultural sector is concerned and therefore, it is an important attribute to agricultural development. This New Technology, though revolutionary, probably remained confined to some pockets of the irrigated areas only. If this be so, it will be difficult to support the thesis that Indian agriculture has developed during last quarter century after independence. We are confining our analysis upto 1972-73 because of absence of comparable statewise data of agricultural production beyond this

year. Our analysis relates to thirteen major states of India accounting for more than 95 per cent of population and agricultural production.

Andhra Pradesh is a classic case where there is no evidence of increase in productivity in the post 1966-67 (table-1). The increase in production in earlier phase was mainly due to productivity increase and to some extent because of area expansion. When viewed against the backdrop of absence of dynamism in second phase, it suggests that the State has remained almost untouched by the New Technology. When one analysis the data relating to changes in irrigation and intensity of cropping (table-2) there is nothing to suggest widespread use of higher level of technology than what was existing. The increase in irrigation and intensity of cropping is too small to suggest any non-traditional technological change. The only evidence of some non-traditional technology is to be found in use of fertiliser and High Yielding Variety seeds and increase in tractor use (table-3). Here also tractor use may have increased mainly on account of transport need. Even then it indicates a technological stride. Maharashtra is a shade worse than Andhra Pradesh. The other extreme is exhibited by Punjab and Haryana. The increase in production and productivity is phenomenal after 1966-67 (i.e. second phase) clearly indicating the impact of the New Technology. The fertiliser use and percentage of area under High Yielding Variety seeds have been second highest. The tractor use has increased by 270 per cent inspite of the fact that it depicts highest number of tractors per hectare both in 1966-67 and 1972-73 (table-3). Not that it ranks first so far irrigation is concerned but that the expansion of irrigation is quite impressive in the second phase. There is sufficient evidence to show that agricultural development has taken place in these two states.

Karnataka, Uttar Pradesh and Kerala find their place next only to Punjab and Haryana, where the production and productivity increase is higher after 1966-67 than before it. While productivity increase is more high in case of Karnataka than Uttar Pradesh, the number of tractors per acre has increased by 150 per cent in Karnataka as against 175, in Uttar Pradesh which has remained second highest in this. While in Karnataka and Uttar Pradesh area effect was hardly visible, on the other hand, in Kerala area effect was more prominent than productivity increase. Moreover productivity increase after 1966-67 was not as high in Kerala as in Karnataka and Uttar Pradesh. But the productivity increase in Kerala in the second phase as compared to the first phase (i.e., pre-1966-67) is much higher (more than three times) than that in Karnataka and Uttar Pradesh. From the point of view of fertiliser and High Yielding Variety seeds the ranking will be in order of Uttar Pradesh, Kerala and Karnataka (table-3). The area expansion in case of Kerala is reflected in increase in intensity of cropping by 10 per cent after 1966-67. This increase in use of land in Kerala can be attributed to strong communist movement there. West Bengal is not much different than Kerala. Here also high production increase in post-1966-67 is explained in terms of both area expansion and productivity increase. High increase in intensity of cropping is in evidence after 1966-67. West Bengal is third highest in case of High Yielding Variety of seeds and ranks ninth from the point of view of fertiliser use. Both in Kerala and West Bengal there is not much evidence of increase in percentage of irrigated area. Thus, the role of communist movement which also brought about changes in the relations of production, can not be ruled out in this context. Uttar Pradesh joins the rank of Kerala and West Bengal in its claim for achieving

agricultural development because Western U.P. is almost similar to Punjab-Haryana belt. But the case of Karnataka is doubtful because of its very low area under High Yielding Variety seeds.

Rajasthan which resembles Uttar Pradesh, Kerala and Karnataka so far trend in production and productivity is concerned suffers from the limitation that the magnitude of change is not as high as theirs. There is evidence of some increase in irrigation and considerable increase in intensity of cropping. The high increase in productivity in post-1966-67 may also be, to some extent, due to the Technology. But nothing definite can be said. Moreover, Rajasthan is also low from the point of view of fertiliser use and High Yielding Variety seeds. It can only be clubbed with Karnataka so far agricultural development till 1972-73 is concerned. Tamil Nadu's production increase after 1966-67 remains at the same level in both the phases but the productivity increase is more pronounced in second phase than before. Here also the area expansion is more prominent than productivity increase for explaining increase in production. Thus, it seems tradition plays more prominent part in explaining the increase in production. The only evidence of use of non-traditional technology is depicted by its highest use of fertiliser (table-3). Madhya Pradesh also shows greater increase in agricultural production after 1966-67 than before it. Productivity increase is there in the second phase but probably the high figure of productivity increase may be due to the decline recorded in first phase. The fertiliser use and area under High Yielding Variety seeds also is the second lowest and lowest respectively in Madhya Pradesh and the tractor use was the second lowest in 1966-67 and the lowest in 1972-73. This is also a classic case of non development. Bihar, Gujarat and Orissa finds

themselves in a situation which is characterized by lower growth of production and productivity after 1966-67 than before it. This indicates that new technology has yet to make its presence felt in these states. Analysed on the basis of fertiliser and High Yielding Variety seeds, Orissa ranks below Bihar and Gujarat. Bihar and Gujarat also show evidence of increase in irrigation. In case of Orissa also the situation is similar. The fall in the percentage of Gross Area Irrigated to Gross Sown Area in the first phase is due to high intensity of cropping and not decline in actual irrigation. Thereafter the irrigation shows an upswing. The case, therefore, is on the same footing so far absence of agricultural development is concerned as in Bihar and Gujarat.

Thus, the States which have achieved agricultural development in the quarter century after independence are Punjab, Haryana, Kerala, West Bengal and Western U.P. These are also the areas where semi-feudal 'relations of production' is found to be weak.¹ Pre-British India was a feudal monarchy which disintegrated with the advent of colonial social formation. But the feudal 'relations of production' was not allowed to disintegrate completely. Landlordism and semi-bonded direct producers (in an altered form) were nourished and strengthened.²

In Permanently Settled and Mahalwari areas, zamindars paid land revenue to government and tenants (who subsequently became occupancy tenants under the zamindars) paid land rent to zamindars. Those of the tenants who leased-out land can be termed as tenant-landlords. The term landlord includes both zamindar and tenant landlords. In Royatwari areas the tenants paid land revenue directly to the government. These tenants also leased-out land and were, therefore, landlords. This thin line of distinction between the

landlords and tenant-landlords vanished by sixties after the abolition of zamindari and Inami rights.

The upper crust of the big peasantry were the only category which enjoyed localised political power and some surplus value which they wasted on petty luxuries. The rest of the big peasantry had very little of surplus value while the middle peasantry had none. The agricultural labourers, by and large, were the 'chronic deficit' households. They were forced to take consumption loans mainly from the big peasantry and also from money lenders on a rather regular basis. The latter subsequently became dominant land holders. This led to a system of informal bondage between the big peasantry and the agricultural labourers. This gave a lot of advantage to the big peasantry. They enjoyed the benefits arising out of 'distress sale' cheap and assured labour and aquired the lands of the agricultural labourers at throw away prices.

The main constituent of the big peasantry in North India, specially in the Hindi speaking belt, were the upper caste Hindus. No upper caste Hindu could be classified as middle peasantry or agricultural labour. The middle peasantry consisted mainly of the middle caste Hindus. Bulk of the agricultural labourers were drawn from Scheduled Castes and Scheduled Tribes. There was no such sharp class and caste identity in South India. No doubt the Brahmin agriculturists were always the big peasantry; the castes, next in hierarchy were both big peasantry and middle peasantry. Therefore, while in North class and caste contradictions were more or less identical, no such identity could be found in the South. Therefore, the anti-Brahmin movement which rocked the South for few decades begining with the twenties of this century, could only

weaken the priestly dominance but did not do any significant damage to other feudal features. On the other hand, the Moplah rebellion which began in eighteen seventies, flared up again in eighteen nineties and nineteen seventies was basically against the usurious exploitation. The fall out also helped the communist movement of enduring nature which considerably weakened the features of feudal dominance in Kerala by early fifties of this Century. It was the same story with the Deccan riots in the black soil cotton growing belt in later half of the nineteenth century. This belt forms a large part of Maharashtra and some part of Gujarat. The flare-up was against the usurers and cotton traders. This flare up followed the cotton boom of eighteen sixties. This and the industrialisation of Western India inspite of the British colonial policy to the contrary, also weakened the features of feudal dominance. Maharashtra agriculture emerged as Kulak agriculture in the post-independence era dominated by big sugar and cotton cooperatives. Similar was the case with Bengal. The early industrialisation of Bengal³, the Pabna peasant uprising of 1873 followed peasant disturbances in Dacca, Mymensingh, Tripura, Backerganje, Faridpore, Rajshahi and Bograh and then the Tebhaga movement against the landlords in later half of the forties of this century weakened the retained features of feudal relations. Something different happened in Punjab-Haryana belt. Akali movement in mid-twenties of this century dislodged the Mahanthalas of Gurudwaras and democratised their management. This gave the firm jerk to the traditional social dominance. Moreover, during the entire period of British

rule, Punjab and Haryana (excluding the areas which form the part of Pakistan) received 10.8 per cent of total investments on irrigation in India where it accounted for less than 2.5 per cent of India's population. Apart from other reasons, Punjab's support to the Britishers against the 1857 rebellion and uprising of Punjab peasantry (which was a very important Military recruitment sector) against growing alienation of lands to the money lenders led the Britishers to go ahead with some constructive works like investment in irrigation and Punjab Land Alienation Act 1902-3 etc. According to one thesis Britishers invested in irrigation in areas which were important military recruitment centres.⁴ There was a steady flow of army income in this area which reduced the percentage of 'chronically deficit' households in a significant manner. Then in mid-thirties of this century there erupted a Kishan Sabha movement also dominated by communists (who were divided into several factions) challenging the exploitative aspects of colonial power, usurers and traders. This resulted in laws relating to debt redemption and restitution of land which were effectively implemented. The riots preceding and following independence of India which resulted in huge transfer of population from east to west and vice-versa, dislodged the big muslim zamindars. The PEPSU movement which began in forties of this century and assumed great importance after independence also resulted in destruction of traditional features of feudal dominance and by early fifties of this century Jat power (i.e. the power of middle peasantry) emerged in Punjab to revolutionise agriculture and a decade later in Haryana.

There are evidences to suggest that there are other areas (like Maharashtra, Gujarat⁵, West Godawari and Costal Andhra in Andhra Pradesh and Tanjaur district of Tamil Nadu) which show weak semi-feudal 'relations of production'.⁶ Still agricultural development does not seem to have taken place in Maharashtra, Gujarat, Tamil Nadu and Andhra Pradesh. This is inspite of the fact that Tamil Nadu and Andhra Pradesh belong to southern India where semi-feudal 'relations of production' is weak and Maharashtra and Andhra Pradesh where irrigation is fairly high (the necessary condition for the New Technology and it is also evident from Table -2, and table-3 that there exists high correlations between irrigation and fertiliser use ($r = 0.84$) and irrigation and High Yielding Variety of seeds ($r = 0.85$). Still Bihar with 25 per cent of Gross Area Irrigated to Gross Sown Area, does not provide evidence for agricultural development. Bihar's non-development can be attributed mostly to semi-feudal 'relations of production'. But the case of Tamil Nadu, Andhra Pradesh, Maharashtra and Gujarat are not similar to that of Bihar. The non-development in such cases can be explained mainly in terms of rising input prices because of Indian market's strong linkage with Western imperialism. This is also corroborated by progressive farmers' growing complain about declining surplus on account of sharply rising input costs. Imperialism otherwise also contributes to the condition favouring poor adoption of technology in agricultural sector and thereby prevents weakening of semi-feudal 'relations of production'. Thus, one can say that non-development of agriculture in large parts of India is mainly due to semi-feudal social formation and imperialist machinations.

Table - 1

| States | Index of Agricultural Production | | Index of Area under all crops | | Index of Agricultural Productivity | |
|------------------|----------------------------------|---------|-------------------------------|---------|------------------------------------|---------|
| | Five Years Ending* | | Five Years Ending* | | Five Years Ending* | |
| | 1966-67 | 1972-77 | 1966-67 | 1972-77 | 1966-67 | 1972-77 |
| India | 108.88 | 122.08 | 104.66 | 103.69 | 102.28 | 113.59 |
| Andhra Pradesh | 114.33 | 101.15 | 102.78 | 100.02 | 111.43 | 100.84 |
| Bihar** | 124.71 | 116.73 | 101.14 | 101.85 | 125.20 | 114.08 |
| Gujarat | 131.69 | 114.70 | 99.44 | 102.82 | 132.66 | 111.10 |
| Karnataka | 110.21 | 129.89 | 97.85 | 99.51 | 112.73 | 130.53 |
| Kerala | 112.98 | 127.67 | 107.75 | 116.17 | 103.75 | 111.03 |
| Madhya Pradesh | 92.86 | 125.32 | 104.50 | 110.99 | 88.82 | 113.15 |
| Maharashtra | 99.36 | 92.14 | 100.56 | 97.35 | 98.78 | 99.80 |
| Orissa | 131.16 | 113.11 | 108.59 | 95.77 | 120.49 | 118.20 |
| Punjab & Haryana | 114.98 | 170.11 | 102.00 | 109.94 | 110.41 | 157.80 |
| Rajasthan | 103.13 | 108.10 | 106.46 | 103.38 | 96.82 | 121.13 |
| Tamil Nadu | 116.36 | 117.32 | 118.57 | 118.80 | 109.72 | 113.83 |
| Uttar Pradesh | 110.71 | 130.70 | 101.97 | 103.32 | 115.83 | 120.39 |
| West Bengal | 118.77 | 124.35 | 106.12 | 108.15 | 114.05 | 112.86 |

* Base period for 1967-68 is the average agricultural production for five years ending 60-61 and for 1972-73 the base period is five year ending 1967-68.

** In case of Bihar data for 1967-68 was taken instead of 1966-67 because this year recorded about 50 per cent decline in agricultural production because of disastrous drought.

- Source of : 1) For Index of Agricultural Production, Jose, A.V., Growth and Fluctuation in Indian Agriculture 1956-57 to 1972-73, Centre for Development Studies, Ullor, Trivendrum, (memeograph).
- 2) For Area under All Crops, Government of India, Ministry of Agriculture and Irrigation.

Table - 2

| | Average Percentage of Gross Area Irrigated to Gross Sown Area | | | Average Intensity of Cropping | | |
|---------------------|---|--------------------------|--------------------------|----------------------------------|--------------------------|--------------------------|
| | 1956-57 to 1960-61 | 1962-63 to 1966-67 | 1968-69 to 1972-73 | 1956-57 to 1960-61 | 1962-63 to 1966-67 | 1968-69 to 1972-73 |
| | | | | | | |
| India | 17.92 | 19.22 | 22.18 | 1.14 | 1.15 | 1.17 |
| Andhra Pradesh | 29.34 | 29.56 | 30.24 | 1.09 | 1.11 | 1.13 |
| Bihar | 18.22 | 20.81 | 25.24 | 1.35 | 1.28 | 1.30 |
| Gujarat | 7.51 | 8.87 | 13.76 | 1.04 | 1.05 | 1.07 |
| Karnataka | 8.16 | 9.96 | 12.97 | 1.03 | 1.04 | 1.06 |
| Kerala | 21.58 | 19.84 | 20.53 | 1.21 | 1.23 | 1.35 |
| Madhya Pradesh | 5.18 | 5.75 | 7.62 | 1.12 | 1.11 | 1.12 |
| Maharashtra | 6.18 | 7.07 | 8.47 | 1.05 | 1.05 | 1.06 |
| Orissa | 18.60 | 13.49 | 15.51 | 1.08 | 1.24 | 1.25 |
| Punjab & Haryana | 39.43 | 47.10 | 60.20 | 1.31 | 1.30 | 1.39 |
| Rajasthan | 12.33 | 13.27 | 16.13 | 1.08 | 1.07 | 1.29 |
| Tamil Nadu | 41.12 | 45.45 | 46.10 | 1.27 | 1.19 | 1.19 |
| Uttar Pradesh | 25.11 | 28.67 | 35.34 | 1.26 | 1.27 | 1.32 |
| West Bengal | 21.93 | 22.83 | 21.81 | 1.16 | 1.19 | 1.26 |

Source of Data : Government of India, Ministry of Agriculture
and Irrigation.

Table 3

| States | Average con- sumption of Fertilisers per hectare in Kg. for the five years ending 1972-73 | Percentage of area under High Yielding Variety of seed to Net Sown Area for the five years ending 1972-73 | Number of tractor per 000 hectares | |
|---------------------|--|--|---------------------------------------|---------|
| | | | 1966-67 | 1972-73 |
| India | 13.20 | 11.33 | .40 | 1.08 |
| Andhra Pradesh | 21.91 | 7.29 | .26 | .57 |
| Bihar | 9.77 | 16.38 | .26 | .69 |
| Gujarat | 12.68 | 8.28 | .34 | .87 |
| Karnataka | 12.89 | 5.12 | .23 | .58 |
| Kerala | 21.45 | 11.60 | .20 | .68 |
| Madhya Pradesh | 3.86 | 3.27 | .15 | .27 |
| Maharashtra | 8.91 | 6.22 | .18 | .34 |
| Orissa | 4.42 | 4.28 | .11 | .32 |
| Punjab + Haryana | 29.55 | 30.22 | 2.09 | 7.77 |
| Rajasthan | 3.15 | 6.04 | .30 | .78 |
| Tamil Nadu | 35.54 | 30.23 | .55 | .85 |
| Uttar Pradesh | 19.52 | 15.86 | .58 | 1.60 |
| West Bengal | 11.18 | 23.79 | .28 | N.A. |

Source of Data : 1) For fertilisers and High Yielding Variety of seeds, the Fertiliser Association of India, Fertiliser Statistics.

2) For Number of tractors, Statistical Abstract of India.

REFERENCES

¹Prasad, Pradhan H., 'Poverty and Bondage, EPW, Special Number, August 1976.

²Prasad, Pradhan, H., 'Production Relations : Achilles' Heel of Indian Planning' and 'Rising Middle Peasantry in North India', EIW, May 12, 1973 and Annual Number, February 1980 respectively.

³Prasad, Pradhan H., 'Industrial Policy in a Developing Country : The Indian Case', Conference Number of Indian Economic Association, December 1976.

⁴I am indebted to Dr. Shaibal Gupta for this thesis.

⁵Maharashtra, Gujarat, Tamil Nadu and Karnataka constitute the belt which shows considerable industrial development on capitalist lines and, therefore, these areas cannot have strong 'semi-feudal' social formation.

⁶See also Prasad, Pradhan H., 'Reactionary Role of Usurer's Capital in Rural India', EPW, Special Number, August 1974, and 'Semi-Feudalism : The Basic Constraint of Indian Agriculture' in Das, A.N., and Nilkant, V., (edited), Agrarian Relations in India, 1979.